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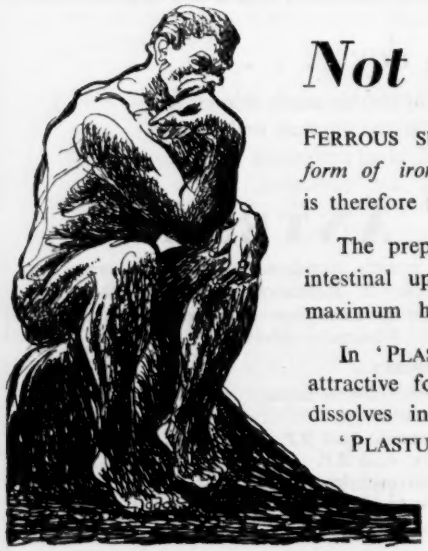

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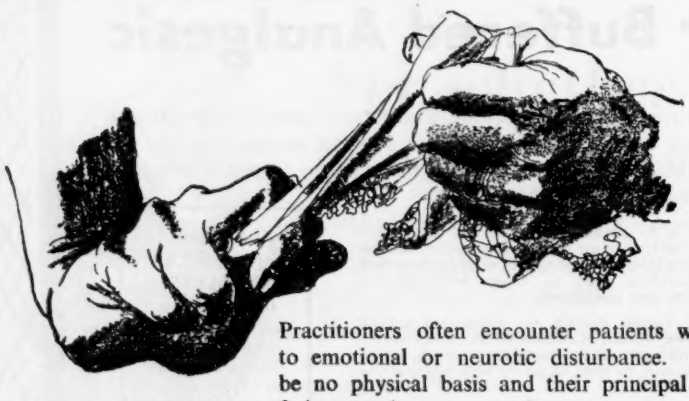

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It is well known that both aspirin and calcium aspirin as generally prepared have physical and chemical defects which restrict their clinical use. Aspirin is acid and sparingly soluble: calcium aspirin is neutral, but unstable, and therefore unpredictable and unpalatable.

'Solprin' overcomes these defects, and combines the advantages of both these valuable analgesics. In contrast with aspirin, 'Solprin' is soluble and substantially neutral: in contrast with calcium aspirin, 'Solprin' is stable and palatable.

Except in cases of extreme hypersensitivity, aspirin, in the form of 'Solprin' can be given in large doses over prolonged periods, without causing gastric or systemic disturbances.

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For surgical "scrub-up", preparation of the patient's skin, sterile storage of instruments, and all post-operative cleansing and disinfection . . .

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Cetrimide B.P. Trade Mark

Bactericide and Detergent

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does not occur with 'Mandelamine'. It is a urinary antiseptic of high potency against most organisms encountered in genito-urinary infections. It occasions no side-effects, and no special regimen is required.
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'MANDELAMINE' tablets

a very safe urinary antiseptic

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MP44

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The distress caused by the piercing, stabbing pains of neuralgia is quickly relieved by the rapid, smooth, analgesic action of HYPON TABLETS, enabling the practitioner to prescribe a safe means of meeting the patient's need. Menstrual pain is also effectively alleviated. Where the cause of distress is of a more chronic nature, as in rheumatism and sciatica, the adverse effects of prolonged medication with codeine and salicylic therapy are eliminated by the inclusion in the formula of caffeine and phenolphthalein. HYPON TABLETS are already widely prescribed by members of the profession for their speedy and safe action with the almost complete elimination of gastric upset. Parallel with the relief from pain, febrile states are effectively reduced in conditions such as influenza, coryza and tonsillitis.

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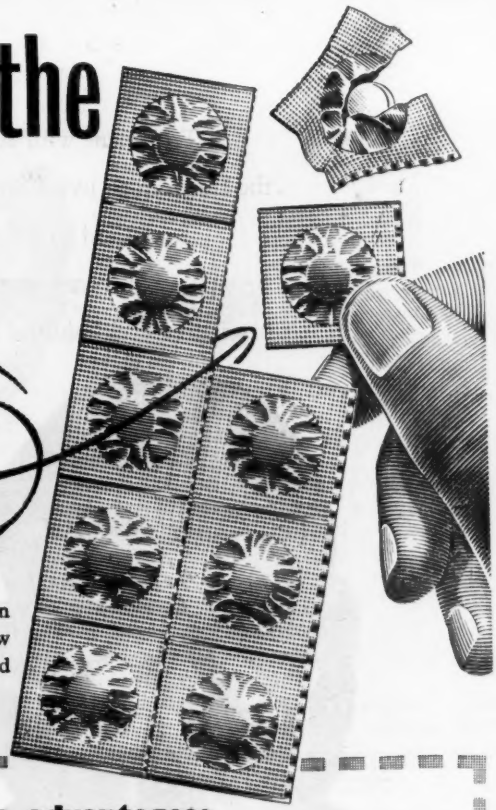
TABILLIN in the new 'Foil-Pac'



This new method of packing protects each tablet until used

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S199

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a drug of choice . . . against staphylococci — because of the high incidence of staphylococcic resistance to other antibiotics.

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Erythrocin . . . is indicated in pharyngitis, tonsillitis, scarlet fever, pneumonia, erysipelas, osteomyelitis, pyoderma and other conditions.

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*BB 15

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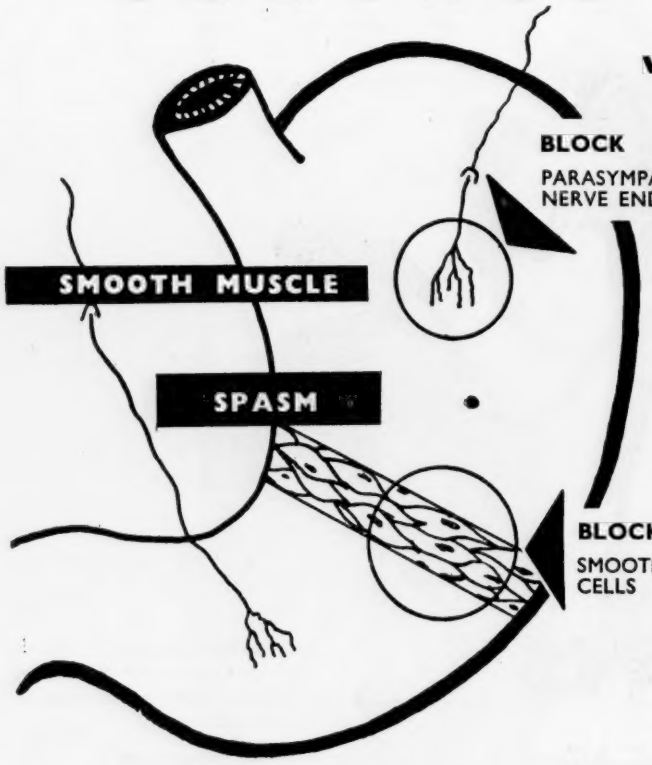

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NO BLURRED VISION

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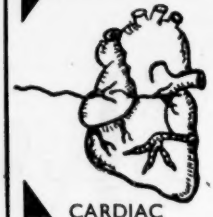

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It has been demonstrated in animal experiments that the new compound bentyl hydrochloride* (beta-diethylaminoethyl l-cyclohexylcyclohexanecarboxylate hydrochloride) possesses both a parasympathetic depressant (atropine-like) and musculotropic (papaverine-like) action on the smooth musculature of the gastrointestinal tract. Hock administered this drug to 67 patients with such gastrointestinal complaints as functional bowel distress, peptic ulcer, chronic pancreatitis and gastroenteritis. The usual dosage was 10 or 20 mg. three or four times daily, with or without 15 to 30 mg. of phenobarbital. The drug was well tolerated in 66 of 67 patients and was stopped in only one patient who showed intolerance to other drugs also. Bentyl hydrochloride appears to be more effective than the belladonna group of antispasmodics and has the advantage of virtual freedom from cycloplegia, mydriasis and xerostomia.

Extract from The Journal of the American Medical Association, Vol. 145, No. 17.

* BENTYL

Bentyl hydrochloride is a Product developed by the MERRELL LABORATORIES, established in 1828 in America. It is marketed in the United Kingdom under the name of MERBENTYL, and is available both plain and with Phenobarbitone.

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Merbentyl and Merbentyl with Phenobarbitone are each available in bottles of 50 and 250 tablets. Each tablet of Merbentyl contains 10 mg. of Dicyclamine Hydrochloride. Tablets of Merbentyl with Phenobarbitone contain 10 mg. of Merbentyl and 15 mg. of Phenobarbitone. Literature and sample available on request.

MERBENTYL REGD

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The low mental state which frequently accompanies the extreme irritation of pruritus presents a difficult problem for the physician. In the majority of cases the condition is relieved by regular application of EURAX, an odourless, non-greasy cream containing 10% crotonyl-N-ethyl-*o*-toluidide. EURAX possesses an extremely low sensitizing index and its activity is not diminished even after prolonged use. EURAX is available in 1 and 4 oz. tubes and in 1 lb. jars.

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Eurax

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ANTIPRURITIC CREAM

Prescribable on N.H.S. form E.C.10.

Geigy

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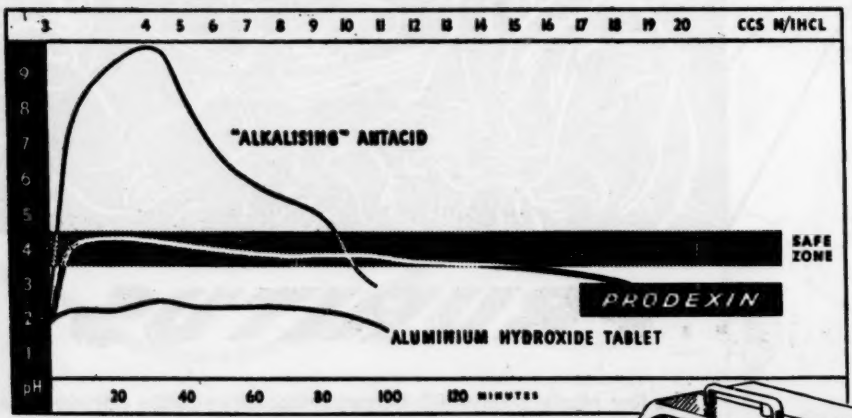
PH. 62

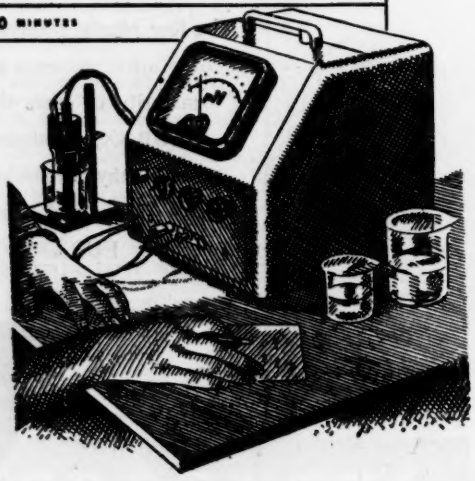
A New development providing *CONTROLLED* antacid therapy

Prodexin is a new product containing aluminium glycinate, and belongs to the buffer group of antacids. It depends for its action upon the slow release, on hydrolysis, of active aluminium hydroxide gel and glycine (amino acetic acid). Glycine rapidly raises the pH to 2, sparing the aluminium gel for the later stage of raising it into the "safe zone" of pH 3·5 to 4·5. Prodexin maintains an equable gastric environment for long periods without alkalisation.



Prodexin provides a convenient, economical and safe treatment for HYPERACIDITY and PEPTIC ULCER.

The tablets, sucked one at a time, maintain the pH of the stomach contents within the "safe zone" for up to two hours. With Prodexin there is no risk of acid rebound or alkalosis. Prodexin tablets are pleasant to suck and they do not form gritty particles in the mouth or give rise to constipation.



PRODEXIN

Each tablet contains:—

Aluminium glycinate.....0·9 gramme.
(*dihydroxy aluminium aminoacetate*)
Light magnesium carbonate.....0·1 gramme.

The basic N.H.S. cost of treatment at the rate of 6 Prodexin tablets daily is 8½d.

Manufactured in the laboratories of

C. L. BENCARD LIMITED

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BENCARD

In many respects THE SAFEST among the potent hypotensives

VERILOID

a unique alkaloidal extract of Veratrum viride

- lowers blood pressure by vasorelaxation independent of vagomotor effect
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- no danger of postural hypotension
- cardiac output is not reduced
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- no decrease of cerebral blood flow
- tolerance or sensitivity rarely develops
- can be given over long periods without loss of efficacy

now in a new and highly advantageous dosage form . . .

WHAT RAUWILOID IS

Rauwiloid represents the standardized alkaloids of Rauwolfia serpentina, each batch being tested in dogs for hypotensive, bradycardic and sedative effects.

RAUWILOID + VERILOID

The addition of Rauwiloid (1 mg.) to Veriloid (3 mg.) in one tablet presents unique advantages. Rauwiloid, a mild hypotensive producing virtually no side-effects, leads to desirable moderate bradycardia, a feeling of calm tranquillity, and rapid remission of symptoms. It apparently potentiates the powerful hypotensive action of Veriloid, thus making it possible to obtain marked reduction of blood pressure from lower doses of Veriloid with less likelihood of side-effects.

The initial dose is one tablet taken three times daily at intervals of not less than four hours, preferably after meals. Once the effect of Rauwiloid is established the dosage should be increased according to the individual's response. Whereas some patients may require as many as two tablets four times a day, the average requirement of Rauwiloid + Veriloid is one tablet four times daily.

"RAUWILOID" and "VERILOID" are Registered Trade Marks

Registered Users:

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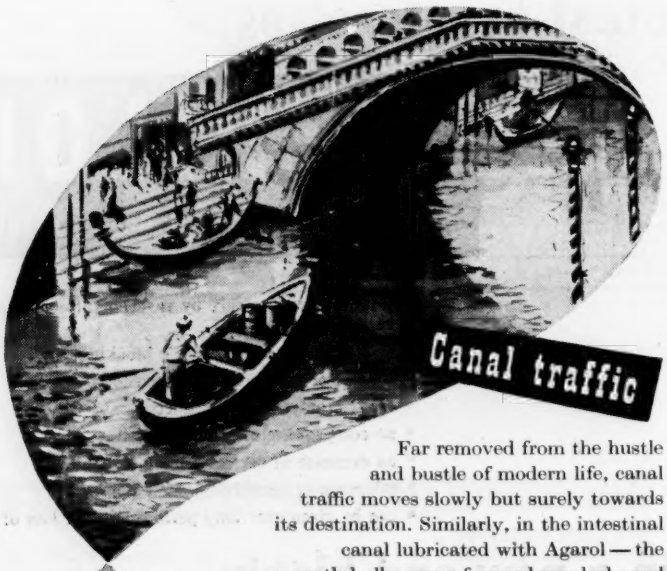

Canal traffic

Far removed from the hustle and bustle of modern life, canal traffic moves slowly but surely towards its destination. Similarly, in the intestinal canal lubricated with Agarol — the smooth bulk moves forward regularly and without strain; the faecal mass is easily evacuated at the end of the journey. The constituents of Agarol establish it as a mild and well-tolerated laxative.

ACTIVE CONSTITUENTS
Agarol Compound is composed of thoroughly emulsified mineral oil in an aqueous agar-agar. Each tablespoonful contains three grains of phenolphthalein.
PACKING: *6 & 14 oz. bottles. For dispensing purposes Agarol is also available in an 80 oz. size at 19/6d. not subject to Purchase Tax on prescription.*

AGAROL

No Warner preparation has ever been advertised to the public.
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DIBISTIN

(0.05 g. Antistin and 0.025 g. Pyribenzamine)

A TABLET COMBINING TWO ANTIHISTAMINES AND THUS ENSURING WIDER RANGE OF CONTROL IN ALLERGIC DISORDERS

Increased percentage response
Reduced incidence of side effects

DIBISTIN CREAM
(1% Antistin and 1% Pyribenzamine)
Particularly valuable in allergic skin disorders where pruritus is severe.

DIBISTIN Tablets Available in bottles of 20, 100 and 500.
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4/4

THE DISTILLERS COMPANY
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'STREPTAQUAINE' brand SOLUTION

stabilised injection of streptomycin sulphate

'Streptaquaine' Solution presents streptomycin sulphate in a ready-prepared stabilised aqueous solution, intended for intramuscular injection without further dilution. The clinical applications of 'Streptaquaine' Solution are, of course, those of streptomycin sulphate but it is more convenient in use. 'Streptaquaine' Solution will remain stable for 12 months at temperatures below 20°C.

Packs: injection-type vials of one mega unit (boxes of 5 vials) and five mega units (boxes of 10 vials)
Strength — 250,000 units per ml.

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10/54

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INSULIN A.B. The original unmodified type. Immediately effective but acting for a relatively short time.

5 and 10 c.c. vials (20, 40 and 80 units per c.c.)

GLOBIN INSULIN (with zinc) A.B. A combination of insulin and globin which has a slower and more prolonged action than Insulin A.B.

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I.Z.S. INSULIN ZINC SUSPENSION A.B.
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Duration of action—24 hours.

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Duration of action—up to 36 hours.

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the original isoniazid

'DROMORAN'
a new analgesic
longer acting than morphine

'RO-A-VIT'
synthetic vitamin A
with no unpleasant taste

1953

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a long-acting oral anticoagulant

'KONAKION'
VITAMIN K_1
the specific antidote to 'Marcoumar' and similar compounds

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a new vasodilator with fewer side-effects

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The Roche laboratories will continue to lead the way in chemical, pharmaceutical and clinical research throughout the world.

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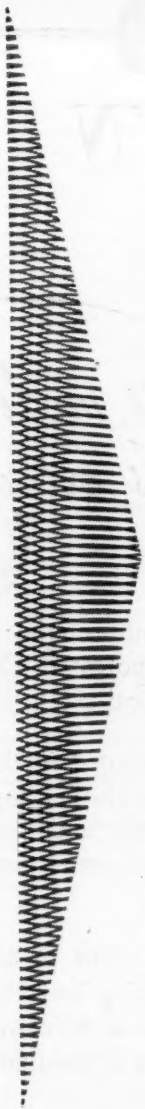
New..

for the prevention or relief of Motion Sickness



'MARZINE' brand Cyclizine Hydrochloride, a new compound for the prevention or relief of motion sickness, is remarkably free from any tendency to produce untoward side effects such as drowsiness, dryness of the mouth or blurred vision.

In clinical trials it was given to over four thousand steamship passengers, the majority of whom reported that the relief obtained was excellent. Similar results were obtained among air travellers. Where sickness had already occurred, 'Marzine' reduced or abolished the symptoms in practically all cases. Side effects in all groups were no more than 4 per cent.

'MARZINE' is of distinct value, too, in the treatment of vomiting of pregnancy and is worthy of trial in the symptomatic management of Ménière's syndrome.

'Marzine' is usually given in a dose of 50 mgm. (one product) three times a day before meals for adults. For children, half this dose is advised. 'Marzine' is issued in tubes of 10 at 2/6 plus 6d. purchase tax and bottles of 100 at 20/- plus 3/9 purchase tax (prices subject to usual discount).

'MARZINE'

CYCLIZINE HYDROCHLORIDE

- leaves the individual alert

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ALFICETYN *Chloramphenicol*
EAR DROPS

Having a wide range of antibacterial action and an exceptionally low sensitising potential, Chloramphenicol is the ideal antibiotic for topical use.

Alficetyn Ear Drops are indicated in the treatment of infections of the ear including chronic suppurative otitis media, chronic otitis externa and cavity infections following tympano-mastoidectomies and fenestration operations.

The reduction in time and effort to effect a cure in these conditions is most striking and Chloramphenicol applied topically in the form of Alficetyn Ear Drops is an advance on previous forms of treatment.

ALFICETYN
EAR DROPS

Containing Chloramphenicol 10% in propylene glycol.

Vials of 5 c.c. with a suitable dropper applicator.

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THE ABUSE OF REST *

W. MELVILLE ARNOTT
T.D., B.Sc., M.D. Edin., M.D. Birm., F.R.C.P., F.R.C.P.E.
PROFESSOR OF MEDICINE IN THE UNIVERSITY OF BIRMINGHAM

THE *Concise Oxford Dictionary* defines rest clearly enough as "repose or sleep especially in bed at night; abstinence or freedom from or absence of exertion or activity or movement or care or molestation." But there are few terms in the English language which possess such a complex superstructure of special meaning and oblique implication as this simple monosyllable. Take for instance its use in relation to gainful employment, of which it is the antithesis. No less an authority than George Schwartz, writing in the *Sunday Times* of Sept. 6, 1953, states (as usual, with his tongue in his cheek) that "if there is one thing that justifies man's claim to be only a little lower than the angels it is that the human race is not fond of work for work's sake."

Rest has an aura of desirability because work includes, or has included, an element of exploitation. Everybody would agree that a week of 70–80 hours toiling in the "dark satanic mills" of the Industrial Revolution was intrinsically harmful, but when a claim is made that to work for more than 40 hours per week in a modern engineering works is unhealthy one is not really expected to believe that it is the toil itself that hurts. Such a claim is merely a move in the complex adjustment of remuneration—the setting of the dividing line between normal and overtime rates.

Consider further the widespread belief that hard work, with its mental and physical activity, plays an important part in the causation of disease. This belief has little rational basis; it does not rest on a critical analysis of the physiology of activity; and it is not attached to any demonstration of damage by repeated muscular contraction, by the elevated metabolism of effort, or by concentrated thought. Indeed there is abundant evidence that none of the known effects of work can harm healthy tissues. On the contrary all these effects are, in a different context, regarded as beneficial in the sense that they develop and extend the range of adaptation of physiological mechanisms.

The evil reputation of work as a cause of disease springs from two rather disreputable and quite illogical traits in human character. The first is the widespread reluctance of medical men to admit frankly that they are ignorant of the cause of disease—that they do not know why a particular person has fallen victim to an infection or why another person's blood-pressure has risen or a clot formed in his coronary artery. The second is the very understandable but really quite indecent avidity with which a patient accepts the explanation that his illness is due to overwork and insufficient rest. It is a belief which nourishes his amour-propre; it enrols him in the noble army of martyrs; he has fallen fighting the good fight. Believing this, he can relax with a clear conscience and enjoy to the full the provisions of a Welfare State, the bondage of a possessive wife, and the plaudits of an admiring family. In brief the general implication is that work is hell and rest is heaven as implied in the words of the lovely hymn which refers to "the saints who from their labours rest."

I am sure then we should all agree that work—even hard work—which involves no avoidable hazard, does not interfere with sleep or nutrition, which is remunerated sufficiently to remove any sense of exploitation, and which allows of enough recreation to counteract tedium, is harmless. Indeed, it is beneficial. One cynic has said that the chief aim of life is to fill in the time between birth and death—which is perhaps why medicine is so popular a profession, for we can all at least be sure that our work will fill our thoughts and direct our activities from when we wake in the morning until late at night we go wearily to bed.

* * *

Now if rest in general were as blameless a state as work there would be no question of abusing it. If the possibility of abuse was merely negative—in that at worst the prescription of rest could do no more than exclude other more useful measures—it would hardly deserve comment. But the truth is that in overdose rest is very toxic and even lethal, and should be classed as one of the most powerful of the "drugs of addiction." Indeed, like morphine, cocaine, and the others, it should be included in the scope of the Dangerous Drugs Act and be prescribable only in clearly defined doses not to be repeated without a further prescription. Of course in a sense this is so, since certificates of incapacity have to be repeated at regular intervals; but all too often repetition is the rule rather than the exception.

Using the term as indicating certified incapacity for normal gainful occupation there are degrees of rest ranging from immobilisation in a plaster cast to a régime of rehabilitatory exercise which make the patient's ordinary occupation a rest-cure by comparison. Rest in bed has come to occupy a large place in current therapeutics: in fact it is widely regarded as normal for the sick person to be in bed. The attitude is such that the burden of proof is on the physician who says the patient should not be in bed, rather than the reverse which I believe is the only logical position. Surely it is normal for a person to be mobile and absurd for him to spend all or most of his time in bed. Once that is accepted—and it is irrefutable—then it becomes illogical to allow or encourage confinement to bed without good and sufficient evidence of its beneficial effect. The difference between the doctor who practises intelligently and with judgment and one whose activities consist in some rather simple conditioned reflexes is that the latter sees nothing incongruous in ordering bed rest without proof of its beneficial value, just as he prescribes iron, vitamin B_{12}, and folic-acid pills in unspecified anæmia or puts all his patients on multiple vitamin pills despite the overwhelming evidence of the rarity of vitamin deficiency in this country. To treat without reason is to ape the witch-doctor and to defend such action by pleading that the patient expects it is a contemptible retreat from reason.

There is abundant evidence that the mere act of immobilising a man produces profound changes in metabolic function. Deitrick, Whedon, and Shorr [1] reported a well-controlled study of the effects of immobilising young healthy men for periods of six or seven weeks. Among the changes observed were (1) negative nitrogen balance to an average extent of 54 g.; (2) a total calcium loss of 9–24 g. This excretion of calcium, combined with unchanged urinary volume, a slight rise in urinary pH and a failure of urinary citric acid to rise, all favour the precipitation of calcium phosphate in the urinary tract. Normal calcium metabolism was not resumed until six weeks after the rest period. Circulatory changes brought about by immobilisation were a decline in total blood volume and a deterioration in the mechanisms essential for adequate circulation in the erect position as indicated by an increased tendency to faint in tilt-table tests. The legs seemed to be the principal site of changes responsible for this deterioration—changes such as venous engorgement, capillary fragility, and impaired muscle tone. Exercise tolerance, leg girth, and pulse-rate took approximately six weeks to return to normal.

* From an address to the Section of Medicine, Royal Society of Medicine, Nov. 24, 1953.

1. Deitrick, J. E., Whedon, G. O., Shorr, E. *Amer. J. Med.* 1948, 4, 3.

This work shows that, even in the healthy young adult, immobilisation causes profound metabolic changes. However, it has long been evident to clinicians that a long sojourn in bed has harmful results, particularly if the patient be elderly. Skeletal changes, such as muscular contraction and wasting, joint malposition, and ligamentous stretching, are common. Urinary calculi can be caused by immobilisation in the horizontal position, while confinement to bed is an important factor in the all too common incontinence of the elderly—a defect which can often be terminated by getting the patient up. Probably the most disastrous complication of bed rest is the bedsore, which can be prevented only by continual attention to the pressure areas, demanding an amount of nursing care which is very hard to provide. Satisfactory alimentary function is very difficult to secure in the bedridden; anorexia and constipation are common. A welcome development in this respect is the increasing realisation that the efficient use of a bedpan is an athletic feat demanding a degree of training, coördination, and endurance which would do credit to the young and healthy. Except in cases of extreme paralysis and major fractures it is usually far better to help the patient on to a commode.

To summarise the harmful effects of bed rest I cannot do better than quote the vivid crescendos of Dr. R. A. J. Asher,[2] who in describing the evils of an overdose says:

"even those evils I have outlined may help to show that rest in bed is anatomically, physiologically, and psychologically unsound. Look at a patient lying long in bed. What a pathetic picture he makes! The blood clotting in his veins, the lime draining from his bones, the scybala stacking up in his colon, the flesh rotting from his seat, the urine leaking from his distended bladder, and the spirit evaporating from his soul."

In the face of this damning indictment it is remarkable that bed rest should be used at all, and still more remarkable that it should be used to the extent implied in the threadbare joke "stay in bed till I come back."

* * *

I cannot claim to have made anything more than a very superficial attempt to trace the history of bed rest as a therapeutic measure. It has, of course always been recognised that rest is essential for the acutely ill person, for no more profound reason than that bodily function is so disturbed that activity is distressing or even impossible. But there is little mention of bed rest in the 18th and early 19th century by such authors as Withering, Heberden, and Stokes. The medical history of John Hunter shows that he spent little time in bed during his various illnesses—though one must not deduce much from that, for he was the sort of rugged individualist who would ignore bodily distress and medical advice. The mid-19th century saw the impact of Hilton's *Rest and Pain*; and as I turned over its pages again there was borne in on me afresh the utter irrationality of therapeutics unrelated to the scientific study of disease. In case after case Hilton scored success, after all sorts of fantastic treatments had failed, because he recognised the value of rest in inflammation—particularly in osteomyelitis and bone and joint tuberculosis which was then so prevalent. As so often happens, opinion swung to the opposite extreme, and rest came to be regarded as the universal healer.

Another reason for undue emphasis on bed rest may be the tendency, since the 19th century, to treat illness in hospital rather than at home. In most hospitals, even today, the patient is expected to be in bed: the whole organisation is geared to such a state, and there is little provision for the up patient. Often, when the patient is admitted, the relatives take his clothes away, bringing them back only when discharge is imminent; for only a minority of hospitals have lockers or stores for the retention of patients' clothing. Furthermore, the routine of the bed bath and the bedpan is firmly established in nursing care. Indeed, many of our older hospitals—especially those for the chronic sick, with large inadequately heated wards and too few nurses—enforce bed rest as the only modus operandi. The visitor to Continental clinics and to tropical hospitals cannot fail to be impressed by the extent to which patients get up and stroll around without any apparent harm—indeed much advantage.

* * *

Finally let me return to the wider question of rest in the sense of absence from employment.

In advising a patient not to work, the doctor assumes responsibility for (1) reducing the patient's income, (2) withdrawing several pounds per week from the Public Purse, and (3) reducing the efficiency of a factory or business: moreover at the same time he enforces on the patient an impression of the gravity of the illness. As these results of the certification of incapacity are obvious, such a costly prescription should never be written without a reasoned belief in its necessity, and the dose should be the minimum calculated to get the desired result. Yet nobody can for a moment suppose that such critical care is universal or even usual in either general or consulting practice.

One hears much of the inalienable right of a doctor to prescribe what he thinks is best for the patient but not enough of the inescapable duty of the doctor to reconcile the good of the patient with the good of the community of which the patient is a part. The vital importance of the welfare of the community as an extension of the welfare of the individual was brought forcibly home to me during the war, when for a time I was the medical specialist of a hospital in a beleaguered garrison. It required little imagination to see that every patient in hospital was one man less on the perimeter—rest was dispensed with rigid economy. If the same spirit pervaded the practice of medicine in present-day Britain there would be substantial advantage both material and moral. Excess prescribing of rest, and excess prescribing of drugs, are millstones around the neck of the health service and the nation—extravagances we cannot afford. Before he advises rest, let every doctor ask himself whether his prescription is really necessary, and, if it is, how little will suffice.

2. Asher, R. A. J. *Brit. med. J.* 1947, ii, 967.

ACUTE APPENDICITIS IN LATE PREGNANCY *

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WHEN acute appendicitis develops in a pregnant woman, a prompt diagnosis may be unusually difficult; for the abdominal pain and vomiting may be attributed to the pregnancy, and the physical signs are altered by the progressive enlargement of the uterus and by the corresponding displacement of the appendix towards the right flank. The difficulty in diagnosis is greatest in the later months of pregnancy, and not all workers are agreed on what is the correct treatment at that time. All previous papers on the subject in English have come from America, except individual cases. Fahmy (1944), for example, described a difficult case at the eighth month.

* The substance of this paper was presented at a joint meeting of the Birmingham and Midland and South-Western Obstetrical and Gynæcological Societies at Birmingham on May 7.

The following case-records refer to patients admitted to the Birmingham Maternity Hospital in 1950–53 with acute appendicitis in the last trimester. The cases range from early to late or neglected admissions and are presented with the object of assessing the criteria of diagnosis and recording the results of treatment by appendicectomy with conservative management of the pregnancy.

Case-records

Case 1.—A woman, aged 31, was admitted as an emergency in the thirty-eighth week of her second pregnancy. Fifteen hours before admission pain came on in the centre of the abdomen, and after five hours it moved to the right iliac fossa. The pain was continuous and moderately severe, and the patient vomited soon after its onset. There was a history of occasional bouts of subacute appendicitis in the previous eighteen years, and on one occasion she had been admitted to hospital for observation but had no operation.

On examination her temperature was 99°F, pulse-rate 86, and tongue coated but moist. There were some guarding and tenderness on pressure in the right iliac fossa. The pregnancy appeared to be normal. On rectal examination no tenderness was elicited. Acute appendicitis was diagnosed.

Laparotomy was undertaken through a right paramedian incision eighteen hours after the onset of pain. Free turbid fluid was found in the peritoneal cavity. The appendix, lying alongside the cæcum, was acutely inflamed but not perforated. Appendicectomy was done, the stump was buried, and the abdomen was closed in layers. The patient received morphine and streptomycin.

Labour.—Twenty-four hours after operation labour began, and after five hours, when the cervix was fully dilated, forceps were applied under general anæsthesia. A healthy child was delivered. The patient made a good recovery, being apyrexial from the second day. There was no distension of the gut, and the wound healed by first intention.

Case 2.—A primigravida, aged 33, was admitted as an emergency, when thirty-nine weeks pregnant, with a history of sudden severe pain in the right iliac fossa coming on six hours before admission. The pain developed into a generalised ache across the lower abdomen. The patient had not vomited.

On examination the temperature was 100°F, the pulse-rate 98, and the tongue slightly furred but moist. The abdomen was a little tense; there was no true guarding or rigidity, but there was tenderness on deep pressure in the right iliac fossa. It was impossible to say whether the source of this tenderness was uterine or extra-uterine, because the pregnancy was filling the abdomen. There was no "release tenderness" or renal tenderness, and rectal examination revealed no abnormality. The fœtal heart was heard. A catheter specimen of urine showed a moderate number of pus cells. The diagnosis rested between urinary infection, appendicitis, and accidental hæmorrhage. In view of the early stage of the condition it was considered proper to allow a short period of observation. Eight hours later the temperature was 98·4°F, and the pulse-rate 92; there was no vomiting and no alteration in physical signs. A further specimen of urine showed only an occasional pus cell. A further period of four hours' observation was undertaken, during which the patient had a sudden sharp attack of abdominal pain like the initial attack but felt in the midline above the pubis. The temperature was 99·2°F, and a white-cell count showed 18,200 leucocytes per c.mm. (76% polymorphs).

Laparotomy was therefore done twenty-one hours after the onset of symptoms. A McBurney incision was made and extended by cutting the muscle towards the loin. The appendix was found grossly inflamed but not ruptured, with fibrinous adhesions to the bowel. Appendicectomy was done, the stump was carbolised but not buried, and the abdomen was closed in layers. The patient received morphine and penicillin. Next day her condition was satisfactory and her temperature normal, but the fœtal heart was not heard; it had last been detected four hours before laparotomy.

Labour.—Four days after the operation labour began spontaneously. After a first stage lasting eight hours a forceps delivery was undertaken under general anæsthesia, and a macerated baby was delivered. There was no evidence of accidental hæmorrhage or of any other reason for the intra-uterine death. The patient's progress continued to be uneventful, and the wound healed by first intention. Nine months later she again became pregnant.

Case 3.—A primigravida, aged 29, was admitted, when thirty-seven weeks pregnant, with twenty-four hours' history of pain beginning in the epigastrium and settling in the right iliac fossa. She had vomited all food taken during this time. A record of her temperature taken before admission showed readings of 98·8° and 99°F.

On examination her temperature was 99°F, pulse-rate 90, tongue coated and dry, and the abdomen tender on pressure in both iliac fossæ, more notably on the right. There was no rigidity or guarding and no tenderness in the loins. "Release tenderness" was classed as doubtful. The uterus was of normal size for a pregnancy near term, and the fœtal heart was heard. Rectal examination showed no abnormality. A catheter specimen of urine showed no pus cells but much acetone. The patient's doctor stated in his letter that she had a previous history of "indigestion" which could have been appendicitis; but on admission it was not felt that the diagnosis could be substantiated, and a period of observation was allowed during which 500 ml. of 10% dextrose solution was given intravenously. Six hours later the patient's temperature was 98·8°F and pulse-rate 84. There was no other significant alteration; but, since the tenderness in the right iliac fossa persisted the patient was operated on.

Laparotomy was performed twelve hours after admission. A McBurney incision was made and extended by cutting the muscle upwards. When the peritoneum was opened, a little free pus was found. The appendix was in an advanced stage of inflammation but had not ruptured; it was lying in the pelvic position. Appendicectomy was done, the stump was buried, and the abdomen was closed in layers without drainage.

Postoperatively morphine was given and the patient's condition was good for the first day. After forty-eight hours she became distended and began to vomit, and paralytic ileus developed. Streptomycin was given, and gastric suction and intravenous therapy without bowel stimulation was continued for four days before peristalsis started again satisfactorily. Thereafter the patient's recovery was uninterrupted.

Labour began spontaneously thirteen days after the operation. The uterine action was somewhat inert, but the patient delivered herself, with the aid of an episiotomy, of a baby weighing 8 lb. 3 oz. The wound healed satisfactorily.

Case 4.—A primigravida, aged 29, was admitted to hospital, when twenty-nine weeks pregnant, with two weeks' history of a "cold" in the course of which she developed pain in the right loin, made worse by walking, and this pain persisted after the cold had disappeared. Four days before admission she complained of sharp pain in the right groin which made her vomit, and this continued up to the time of admission. No record was available of her temperature during this time.

On examination her temperature was 96·8°F, pulse-rate 110, and tongue dry and furred. Tenderness was greatest in the right iliac fossa. A catheter specimen of urine showed no abnormality, and acute appendicitis with peritonitis was diagnosed.

Laparotomy was undertaken through an extended gridiron incision. Much pus was found in the peritoneal cavity. The appendix was retrocæcal and acutely inflamed but not ruptured. Appendicectomy was done, the stump was oversewn, a stab drain was inserted laterally, and the abdomen was closed in layers. Penicillin powder was dusted into the wound, and therapy with systemic penicillin and soluble sulphathiazole was begun immediately. Intravenous therapy was also begun at once, no fluid being given by mouth.

Labour.—Thirty-two hours after the operation labour began spontaneously, and after four hours low-forceps delivery was done under local infiltration anæsthesia; the baby was alive but premature and died soon after birth. No flatus was passed, and no gut sounds were heard for two days after the operation; but on the third day, when intravenous fluids were still being given, peristalsis began and the patient began to pass large liquid stools. She continued to have several loose motions daily for a few days. On the fourth day after operation her hæmoglobin was 36% and red cells 2,430,000 per c.mm. Altogether two pints of blood was therefore given on the fifth and sixth days, with considerable symptomatic improvement. The wound healed well, and the following year the patient had a normal pregnancy and delivery.

Case 5.—A woman, aged 31, was admitted at the thirty-sixth week of her fourth pregnancy. Throughout the pregnancy

she had not felt well. Six weeks before admission she complained of right-sided abdominal pain, shivering, sickness, and frequency of micturition. She was confined to bed for three weeks and was attended by her doctor; after this the pain became intermittent and less severe. Thirty-six hours before admission she had acute right-sided abdominal pain and vomited once. The pain persisted during the next day, and she vomited again. She began to want to pass water every few minutes and felt feverish. She was then admitted to hospital.

On examination she looked toxic, and her temperature was 99·8°F, pulse-rate 120, and tongue furred and dry. Her uterus was enlarged to the size of a full-term pregnancy, contracting strongly but relaxing normally between contractions. The fœtal heart was heard. There was tenderness on pressure over the right side at the level of the umbilicus, and the patient noticed similar pain when the fœtus moved. There was neither rigidity nor release tenderness, but there was slight tenderness on pressure over the right costovertebral angle. On vaginal examination no tenderness was felt and the cervix was not dilated. A cathether specimen of urine showed only an occasional pus cell but much acetone. The diagnosis seemed to rest between acute appendicitis and a relapsing pyelitis. It was decided to wait for a short time during which intravenous fluids and morphine were to be given. Four hours later the pulse-rate was 92, and after a further five hours the patient was feeling better and the pain was less. Her temperature was then 99°F and pulse-rate 112. Twelve hours after admission her temperature was 98·4°F and pulse-rate 100. She had had 2 litres of dextrose, 1 containing saline solution, and there was no acetone in her urine. She had vomited a few ounces of clear fluid, however, and there was tenderness on the right side of her abdomen at the level of the umbilicus.

Laparotomy was therefore undertaken, forty-eight hours after the onset of symptoms, through a McBurney incision extended by cutting the muscle. Free purulent fluid was present in the peritoneal cavity, and the inflamed appendix was found crossing the pelvic brim and burying its tip in the back of the broad ligament. The tip was firmly adherent and was separated only with difficulty. The fallopian tube and ovary were drawn down to this inflammatory zone. Appendicectomy was done, and the stump was buried. Penicillin powder 5 g. was placed in the peritoneal cavity, and the pelvis was drained through a rubber tube brought out through the lower end of the wound. The abdomen was closed in layers.

Postoperatively the patient became cyanosed whenever the administration of oxygen was stopped; so it was necessary to continue giving oxygen on her return to the ward. Treatment with intravenous fluids and large doses of penicillin and streptomycin was begun. Next morning the patient still tended to be cyanosed and was dyspnœic at rest, though the lung bases were clear. That day routine investigation of her blood chemistry revealed considerable methæmoglobinæmia. An intravenous injection of 10 ml. of methylene-blue solution improved her colour without entirely relieving her cyanosis. Occasional bowel sounds were heard; but there was considerable distension, and the stomach contents were therefore aspirated with a Ryle's tube left in situ. She received a mixture of Darrow's solution, Hartmann's solution, and 5% dextrose intravenously; and her general condition improved next day, although the ileus remained.

Labour.—Forty-eight hours after operation, with very little warning, she delivered herself of a healthy baby weighing 6 lb. 9 oz. Thereafter her pulse-rate improved, dyspnœa ceased, and tendency to cyanosis disappeared. The ileus was suddenly relieved on the third day, and she began to pass a large amount of liquid stools, after which the bowel returned to normal. The peritoneal drain allowed a large volume of serous fluid to escape, and this continued for some days after its removal. An alarm was raised that this contained a gas-forming organism, and anti-gas-gangrene serum was given; but her convalescence proceeded satisfactorily, and she was discharged after sixteen days. When she was seen as an outpatient, her wound had healed well and the baby was progressing satisfactorily.

This patient's breathing was considerably embarrassed by the combination of ileus secondary to peritonitis and a full-term uterus inhibiting movement of the diaphragm. If she had not gone into labour spontaneously, rupture of the membranes might have been justified to provide relief. The improvement after delivery was dramatic.

Case 6.—A woman, aged 25, was admitted, in the thirty-ninth week of her second pregnancy, with seven days' history of epigastric pain continuing until eighteen hours before her arrival in hospital, when it shifted to the right side and became spasmodic and severe. She had been vomiting for five days, and shoulder pain had arisen twelve hours before her admission. She was unmarried and had neglected to inform her doctor of her pregnancy and her illness alike.

On examination her temperature was 98·8°F, pulse-rate 110, and tongue dry and coated. Her abdomen showed generalised tenderness, maximal on the right side. Her abdominal wall was tense but not rigid. There was no release tenderness. The uterus was enlarged to the size of a full-term pregnancy, and the fœtal heart was heard. On rectal examination there was no undue tenderness. A catheter specimen of urine showed no pus cells. Acute appendicitis was diagnosed.

Laparotomy was done through a right paramedian incision. Pus was found in the right paracolic gutter, and free fluid in the abdominal cavity. The appendix was found perforated, lying coiled behind the ascending colon. On dissection it broke off at its base, and the base could not be ligated. The patient's condition was then very poor. A stab-drain was made in the loin and the wound was closed, but she died undelivered six hours after operation. Cæsarean section post mortem produced a stillbirth.

Necropsy Findings.—Fibrinous exudate was present in the peritoneal cavity, causing adhesions between loops of bowel and occasional pockets of pus on the right side; the fibrinous exudate extended to the liver and diaphragm. In the cæcum there was a ragged abscess cavity, mostly retrocæcal and confined to the exterior of the bowel.

Diagnosis

HISTORY

2 patients gave a history of previous bouts of pain in which appendicitis was suspected, and this may be a valuable hint, as noted by Kerr and Moir (1949). The *pain* was typical of appendicitis (starting in the midline and soon settling in the right iliac fossa) in only 2 cases. In the other cases it could not be well localised by the patient and was described as "right-sided" or "lower abdominal." 1 patient noted pain on fœtal movement. *Vomiting* at, or soon after, the onset of the pain occurred in all but 1 case (case 2), in which the history was deceptively trivial. *Rigors* did not occur in any case, but 2 patients (cases 4 and 6) described symptoms lasting two and six weeks and suggesting infection of the urinary tract, and it was particularly difficult on first examination to reach a correct diagnosis in these cases.

EXAMINATION

The *temperature* on admission ranged from 96·8° to 100°F and bore no relationship to the severity of the condition within the abdomen. The *pulse-rate* provided a better indicator, being less than 100 in patients with less than twenty-four hours' symptoms. The *tongue* also proved to be a reliable index of the patient's general condition, being coated in all the cases and moist only in the early admission. The *abdomen* is never easy to examine in these cases with a pregnancy near term. Krieg (1949) states that examination often shows an "interesting lack of findings." I prefer to emphasise the uncertainty of the physical signs compared with the clear-cut clinical findings of typical appendicitis in the non-pregnant patient.

Tenderness was present in all the cases, sometimes extending to the right hypochondrium and across to the left iliac fossa, but always maximal in the right iliac fossa or in the right para-umbilical area. It was never confined to a "point," and a confirmatory examination after an interval was often necessary to make certain that the right iliac fossa was the main source of trouble. In seeking to localise the site of abdominal tenderness, it should be recalled that the appendix is displaced upwards and outwards towards the flank as pregnancy advances (Baer et al. 1932). On occasion it was difficult to decide whether the source of the tenderness was

uterine or extra-uterine—e.g., in case 2. Only twice was guarding or rigidity noted, and release tenderness was not certainly defined in any case. *Vaginal* and *rectal* examinations were not helpful. This is what might be expected, because the depth of the pouch of Douglas is reduced in late pregnancy, and its contents are displaced upwards by the fœtal head.

Auxiliary investigations have not been widely used in these cases. Krieg (1949) points out that a white-cell count is never pathognomonic and may be misleading—a third of his patients had counts of less than 14,000 per c.mm.—but a high count may confirm a presumptive diagnosis of appendicitis. A catheter specimen of urine should always be examined; but, since a clear specimen does not exclude pyelitis in pregnancy, and a small number of pus cells does not inculpate the renal pelvis, the only positive help comes from specimens which show a massive urinary infection.

DIFFERENTIAL DIAGNOSIS

Only two conditions were considered as alternative diagnoses in these cases. In case 2, where the tenderness was at first thought to be referred to the uterine wall, a small concealed accidental hæmorrhage was considered, but subsequent examination suggested an extra-uterine source of inflammatory nature, a suspicion which was supported by a slight rise in temperature and a raised white-cell count. In cases 2, 3, and 5 pyelitis was considered as a possible or probable diagnosis on first examination, but in all the cases appendicitis was suspected. In these cases delays of twelve hours occurred before laparotomy; in each case rest in bed and the use of sedatives produced a dangerously misleading improvement within four hours, and further periods of observation were allowed. In the absence of *positive* evidence of pyelitis after four hours this was probably an error of judgment. In case 4 the general practitioner was similarly misled to believe in a urinary cause for pain, and a rather longer delay resulted. Baird (1935) holds that in such cases a ureteric catheter should be passed, since this would relieve pain of renal origin. Other and rarer conditions may easily be confused with appendicitis. Child and Douglas (1944) and Priddle and Hesseltine (1951) list several such sources of error in their series (degenerating myoma, salpingitis, torsion of cyst, &c.).

Thus the early diagnosis of appendicitis in pregnancy must be made on relatively few clinical findings. The history may simply be that of abdominal pain, usually accompanied by vomiting and without rigors. On examination the patient is pyrexial but the temperature is commonly not much raised (100°F or less), the tongue is coated, and there is right-sided abdominal tenderness not well localised. There are no other reliable signs, and auxiliary investigations are disappointing. The condition most commonly confused with it is acute pyelitis. Probably in most cases of pyelitis severe enough to cause pain and vomiting a high temperature and pulse-rate will be recorded, whereas patients with low-grade pyrexia will rarely complain of abdominal pain. Unless there is a temperature of 101°F or more, with a history of rigors and with frank pus in the urine, it is dangerous to ascribe right-sided tenderness to pyelitis; for, as emphasised by all writers since Babler (1908), delay in the treatment of appendicitis in pregnancy is a most serious mistake.

Treatment

On studying the *management* of these 6 cases the most striking fact which emerges is the difference between the cases subjected to appendicectomy early (cases 1 and 2) and those (cases 4, 5, and 6) in whom operation was delayed forty-eight hours or more after the onset of symptoms. The former made a smooth recovery, whereas the latter had a stormy and worrying postoperative course due to peritonitis and ileus. At laparotomy the best exposure in late pregnancy has been obtained through a high McBurney incision, starting in the plane of the anterior superior iliac spines and extending it upwards by cutting the muscle in the direction of the right loin.

In no case was the appendiceal infection localised. Many previous workers have commented on this and offered explanations—e.g., Warfield (1950). The main responsible factors appear to be the upward displacement which the appendix undergoes in pregnancy, the barrier placed in the way of the protecting omentum by the enlarged uterus, and the mobility of the inflamed zone due to the large contractile organ in close relation to it. In all the cases the general peritoneal cavity contained free fluid, fibrinous adhesions, or free pus. The appendix was not found in any constant position. A stab or wound drain was used in those cases where the appendix was ruptured, or where free purulent fluid was present in considerable amount. Antibiotics were used in all the cases, though it may be unnecessary in the early cases. It is a recurring fear of previous workers that the effect of labour will be to disseminate intraperitoneal infection—indeed cæsarean section has been advocated to avoid this (Crossen and Crossen 1948)—therefore every patient received antibiotics. In this series there was no evidence that *labour* following appendicectomy caused any such deterioration. 3 of the 5 patients who survived went into labour within forty-eight hours of operation. In all of these cases labour was uneventful; forceps delivery was undertaken when practicable to prevent maternal distress and to relieve strain upon the abdominal wound, but in all the cases healing of the wound was satisfactory, and any anxieties we felt were, in retrospect, largely unwarranted. Other workers—e.g., Meiling (1947)—have commented on the onset of premature labour following appendicectomy, and it seems that the onset of labour may be expected within forty-eight hours of operation in a good number of these patients near term.

The *baby* was unaffected by the mother's illness except in case 2, where the stillbirth remains unexplained. De Voe et al. (1947), discussing a similar intra-uterine death, suggest severe maternal acidosis as a factor, but in the present case the patient's general condition was good.

The *postoperative* course was uneventful in cases 1 and 2. In the cases subjected to laparotomy after a

TABLE I—HISTORY

Case no. and year of operation	Age (yr.)	Gravida	Gestation (weeks)	Symptoms			
				Location of pain	Vomiting	Other	Duration on admission (hr.)
1 (1953)	31	2	37	Midline→right iliac fossa	+	None	15
2 (1952)	33	1	39	Right iliac fossa→lower abdomen	..	None	6
3 (1951)	29	1	37	Midline→right iliac fossa	+	None	20
4 (1950)	29	1	29	Right groin→"right side" and midline	+	Previous (2 weeks) right loin pain on walking	96
5 (1953)	31	4	36	"Right side"	+	Frequency of micturition; previous 6 weeks' history suggesting pyelitis; tenderness on movement of fœtus	36
6 (1950)	25	2	39	Epigastrium→"right side"→shoulder	+	..	ca. 170

TABLE II—EXAMINATION

Case no.	Clinical findings on admission						Investigations	
	Temperature (°F)	Pulse-rate	Tongue	Abdominal tenderness	Abdominal rigidity	Release tenderness	Urine (catheter specimen)	White-cell count (per c.mm.)
1	99·0	86	Coated, moist	+ Right iliac fossa	"Guarding"	Nil	Not done	Not done
2	100·0	98	Coated, moist	+ Right iliac fossa	Nil	Nil	Pus cells + (moderate number)	18,200 (polymorphs 76%)
3	99·0	90	Coated, dry	+ Both iliac fossæ right > left	Nil	Doubtful	No pus	Not done
4	96·8	110	Coated, dry	+ Maximal in right iliac fossa	+	Not noted	No pus	Not done
5	99·8	120	Coated, dry	+ Right side	Nil	Nil	Pus cell occasional	Not done
6	98·8	110	Coated, dry	+ Maximal in right iliac fossa	Nil	Nil	No pus	Not done

delay of more than twenty-four hours ileus secondary to peritonitis caused anxiety but responded finally to antibiotics, gastric aspiration, and intravenous replacement therapy biochemically controlled.

The clinical findings are summarised in tables I–III.

Discussion

The incidence of acute appendicitis in pregnancy is estimated to be about 1 in 1000–2000 cases (Baer et al. 1932, Child and Douglas 1944, Priddle and Hesseltine 1951), but it is probably higher than some workers suggest whose figures are taken from institutions dealing with obstetrics and gynæcology only. There seems to be no good reason to believe that the occurrence of appendicitis should be altered by the existence of a pregnancy (Johnson 1944). On the other hand, it is widely held that a patient subject to recurrent attacks of appendicitis is more liable to have an exacerbation during a pregnancy. The incidence of appendicitis in the different trimesters of pregnancy is assessed variously by different workers. The incidence is the same in the different trimesters in the series of Priddle and Hesseltine (1951) and Hoffman and Suzuki (1949), but most of the recent writers suggest that acute appendicitis is rarer in the last trimester (Child and Douglas 1944, Krieg 1949, Meiling 1947). No really satisfactory explanation for this has yet been offered. The most telling comment is that of Child and Douglas, who, noting the difficulty of diagnosis in a patient near term and the "natural hesitancy of obstetricians and surgeons to complicate a term pregnancy by an operation," suggest that appendicitis may be no less common in late pregnancy, but that an undue number may be given the opportunity of subsiding spontaneously. Thus, they infer, some patients will remain at home with their pain attributed to degeneration in a fibroid or to a small accidental hæmorrhage, and will recover spontaneously. Others, diagnosed as having pyelitis, may receive chemotherapy and have their appendicitis cured. But some such patients will develop true obstructive appendicitis and require subsequent admission to hospital. If this be true, one would expect fewer admissions in the last trimester but a higher mortality-rate because of the inclusion of these late or neglected cases. Reference to table IV appears to confirm this deduction.

In the present series, in relation to the question of misdiagnosis, it is reasonable to speculate whether the history of pyelitis preceding the acute phase of symptoms in cases 4 and 5 might not have been confused with that of subacute non-obstructive appendicitis. In fact I consider that many cases of appendicitis in pregnancy may be treated (sometimes successfully) as pyelitis with sulpha drugs and antibiotics, especially in the later months; and I believe that a reasonable suspicion of acute appendicitis at *any* stage of pregnancy should lead to laparotomy without delay. It will be seen that our own practice has fallen short of this precept (cases 2, 3, and 5), yet a delay of more than four hours has seldom given any valuable information, and in retrospect I feel that further hesitation was unjustifiable in these cases (except perhaps in the very early admission, case 2).

At laparotomy, if appendicitis is confirmed, appendicectomy should be done without further interference. Though this opinion is now held by most workers, some (Meiling 1947, Potter and Sadugor 1949, Renn et al. 1951) have reported cases in the last trimester in which

TABLE IV—PUBLISHED CASES OF ACUTE APPENDICITIS IN PREGNANCY

Reference	Total no. of cases		Cases in first 6 mos. of pregnancy		Cases in last 3 mos. of pregnancy	
	No. in series	No. of deaths	No. of cases	No. of deaths	No. of cases	No. of deaths
Child and Douglas (1944)	25	2	21	0	4	2
Cosgrove (1937) ..	18	1	9	0	9	1
*Krieg (1949)	51	3	42	1	9	2
Meiling (1947)	25	2	21	1	4	1
†Priddle and Hesseltine (1951)	28	1	..	..	..	..
Priest (1936)	6	0	5	0	1	0
†Smith and Bartlett (1940)	20	3	..	..	..	..
†Twyman et al. (1940) ..	28	0	..	..	..	..
Warfield (1950) ..	5	0	3	0	2	0
Total	206	12 (5·8%)	101	2 (2·0%)	29	6 (20·7%)

* 1 fatal case is omitted from the series because the period of gestation at death is unknown.
† No further analysis possible, because the period of gestation is not stated.

TABLE III—TREATMENT

Case no.	Operation			Result			
	Time after onset of symptoms	Condition of appendix	Drain	Onset of labour after operation	Ileus	Mother	Child
1	18 hr.	Acutely inflamed	Nil	24 hr.	Nil	Recovered	Alive and well
2	20 hr.	Acutely inflamed	Nil	4 days	Nil	Recovered	Stillborn
3	30 hr.	Acutely inflamed	Nil	13 days	+ from 2 to 7 days after operation	Recovered	Alive and well
4	100 hr.	Acutely inflamed	Stab rubber tube in loin	32 hr.	+ from 2 to 7 days after operation	Recovered	Born alive, premature; neonatal death
5	48 hr.	Acutely inflamed, probably ruptured at tip	Tube drain in wound	48 hr.	+ +	Recovered	Alive and well
6	7 days	Necrotic at base, abscess around	Stab drain in loin	..	..	Died	Stillborn

appendicectomy was successfully combined with cæsarean section. I suspect that the danger of peritonitis spreading after appendicectomy, owing to the presence of a contractile uterus, is a theoretical risk not borne out in practice today, and it certainly does not warrant routine opening of the uterus in the presence of known peritoneal sepsis. Where labour is imminent or in progress at the time of appendicectomy, and where an absolute barrier to vaginal delivery exists, the combined procedure will be necessary; it is in such cases that Kerr and Moir (1949) suggest that appendicectomy might be combined with cæsarean section followed by total hysterectomy to provide drainage. In these circumstances, I think, hysterectomy should not be necessary, provided that antibacterial agents are freely available, but experience of such cases must obviously be very limited.

The objection may rightly be made that unnecessary laparotomies will be done as a result of these recommendations. In both the series of cases recorded by Child and Douglas (1944) and Priddle and Hesseltine (1951) 41 patients were subjected to laparotomy with a diagnosis of acute appendicitis. The diagnosis proved correct in only 25 and 28 cases respectively, but other conditions warranting laparotomy (ectopic pregnancy, twisted ovarian cyst, &c.) were found, and in only 5 cases in each series (of pyelitis or gastro-enteritis) was the laparotomy a mistake. In the four years during which the 6 cases reported here were treated at the Birmingham Maternity Hospital, 1 laparotomy was done in a case of pyelitis because appendicitis was suspected. It is admitted that, if appendicitis is to be treated early, as it must be in pregnancy, an occasional laparotomy will be done in error, but this seems a small price to pay for a handsome reward.

In assessing the results of the treatment of appendicitis in pregnancy today it is difficult to arrive at a figure representative of an over-all mortality. Meiling (1947) cites a maternal mortality-rate of 0·71% when disease is limited to the appendix, rising to 30% when peritonitis develops, and 50% after rupture of the appendix, and it is said that the rate is about 25% during the last trimester. These figures are probably dated, and in an effort to make an estimate in keeping with modern conditions table IV was compiled from series of 5 or more cases published in America in the last twenty years. Cases of true acute appendicitis only are included, and I believe that there is no overlapping between the series. Although no statistical reliance should be placed on figures from these obviously selected cases, an over-all mortality-rate of 5% may not be unfair for present-day conditions, and I submit that a mortality-rate for the last trimester ten times as high as that in the first six months proves conclusively the danger of the condition reported here.

Summary

6 cases of acute appendicitis complicating late pregnancy are described. 1 mother and 3 babies were lost.

The criteria of diagnosis are discussed with the object of minimising the delay in doing a laparotomy; in late pregnancy abdominal pain and vomiting with poorly localised right-sided tenderness and low-grade pyrexia means appendicitis until proved otherwise.

Appendicectomy without interference with the pregnancy through a high McBurney incision is advocated.

Labour tends to follow soon after operation, but no ill effects of this have been observed.

The mortality of appendicitis in late pregnancy is believed to be ten times as great as that in the early months, and possible reasons for this are discussed.

I wish to thank members of the consultant staff of the Birmingham Maternity Hospital for permission to publish case-records; especially Prof. H. C. McLaren, under whose care cases 2 and 5 (whom I treated) were admitted, and Mr. A. L. Deacon, F.R.C.S.E., who operated on cases 3 and 4 and gave me much valuable advice in the preparation of this paper.

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PROTECTIVE ANTIGEN OF HÆMOPHILUS PERTUSSIS

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IN a preliminary report (Pillemer 1950) it was shown that an antigen (P.A.) could be extracted from *Hæmophilus pertussis* by sonic disintegration, and that it combined irreversibly under special conditions with human red-cell stromata. The stromata-protective antigen complex (S.P.A.) was shown to be a highly protective agent, judged by its ability to protect mice against intracerebral infection with *H. pertussis*, to be free from pertussis toxin, and to represent only a minute proportion of the organism.

We describe here investigations of the factors which influence the liberation of P.A. from *H. pertussis*, and of the conditions required for the interaction of P.A. with stromata. As a result of these investigations a method was devised for the large-scale preparation of S.P.A. for use in clinical trials.

Materials and Methods

H. pertussis Suspensions

A strain of *H. pertussis* designated 134 was used. The strain had been maintained in the vacuum-dried state. Other strains have also proved satisfactory, but most of the present work was done with no. 134, which proved amenable to sonic disintegration and produced little or no hæmagglutinin. Moreover, whole bacterial vaccines prepared from strain 134 protected mice against experimental intracerebral infection with *H. pertussis*.

In preparing suspensions for sonic treatment the following procedure was adopted:

The strain was cultured at 34°–36°C on Bordet-Gengou medium containing 30% sheep blood, and the 24–48 hr. growth was inoculated into flasks of modified Cohen and Wheeler (1946) medium made with a specially prepared human peptone (supplied by Lederle Laboratories). The flasks were incubated at 34°–36°C for about 40 hr. with gentle agitation, during which time the total bacterial count increased from

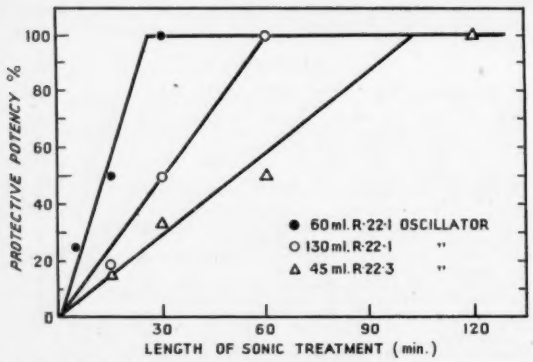

Fig. 1—Protective potency of S.P.A. prepared from 500 × 10^9 organisms per ml. subjected to sonic treatment for different lengths of time. In figs. 1–5 the protective potency is given as a percentage of the potency of the parent bacterial suspension.

about 1 × 10^9 per ml. to about 50 × 10^9 organisms per ml. (U.S. National Institutes of Health opacity standard). The bacteria were separated from the culture and washed with distilled water at 1°C and then stored at 2°–5°C for no longer than 24 hr. before resuspension and sonic disintegration. The deposit was suspended in distilled water to give a concentration of about 500 × 10^9 organisms per ml. Throughout these operations sterile precautions were observed, since it was impossible to sterilise S.P.A. by filtration.

Stromata

Group-O Rh-negative erythrocytes were washed four times with 5 volumes of 0·15 *M* sodium chloride at 1°C and then lysed by adding 10 volumes of cold distilled water to 1 volume of packed cells, adjusting the pH value of the mixture to 5·2–5·4 with acetic acid, and allowing it to stand overnight at 1°C. The stromata were then centrifuged at 1°C for 1 hr. at 4000 r.p.m. and washed three times with 20 volumes of cold distilled water. A 50% suspension was prepared from the deposited stromata by suspending them in water to twice the volume which the washed packed cells originally occupied. This suspension was autoclaved at 15 lb. for 30 min.

Sonic Oscillators

Two types of sonic oscillator, manufactured by the Raytheon Manufacturing Company, Waltham, Massachusetts, U.S.A., were used: type R-22-1 (10 kilocycles, 200 watts) and type R-23-3 (9 kilocycles, 60 watts). The former type proved the more successful since it could deal with larger volumes and was more efficient in liberating P.A. The vibrator-cup assembly was autoclaved at 15 lb. for 30 min. and then filled with the bacterial suspension, which was maintained at 1°C during sonic treatment.

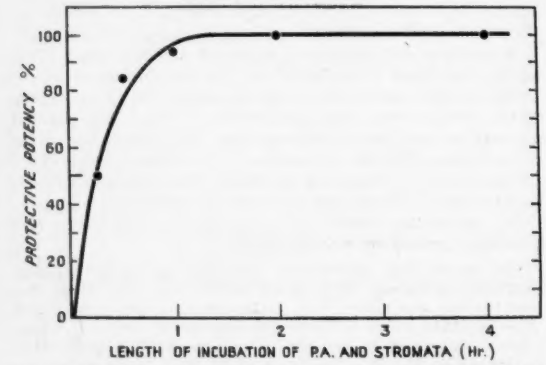

Fig. 2—Protective potency of S.P.A. prepared by interaction of P.A. and stromata for different lengths of time; other conditions constant.

Assessment of Protective Potency

The protective potency of the various preparations was tested by immunising mice and determining the level of immunity by intracerebral challenge of virulent *H. pertussis* (Kendrick et al. 1947). All the preparations were diluted before testing so that they contained the equivalent of 10 × 10^9 organisms per ml. It was thus possible to compare their protective action directly with that of the parent bacterial suspension made up to a concentration of 10 × 10^9 organisms per ml. and to express their potency as a percentage of the potency of the bacterial suspension (figs. 1–5).

In assessing the potency of S.P.A. prepared for clinical trials at least three tests were made on samples from each batch by the method suggested by the United States National Institutes of Health (1952) using their reference pertussis vaccine.

Experimental

PREPARATION OF SONIC EXTRACTS

It was found that the amount of P.A. liberated from the organisms depended on the volume of the suspension, the type of oscillator, the temperature, and the time of sonic treatment. Optimal conditions were obtained with Raytheon oscillator type R-22-1, when 60 ml. of an aqueous bacterial suspension containing 500 × 10^9 organisms per ml. was subjected to sonic disintegration at 1°C for 30 min., or 130 ml. for 2 hr. The Raytheon type R-22-3 was not so effective (fig. 1). These optimal conditions for the production of P.A. relate entirely to strain 134; if other strains are used, the optimal conditions may be different.

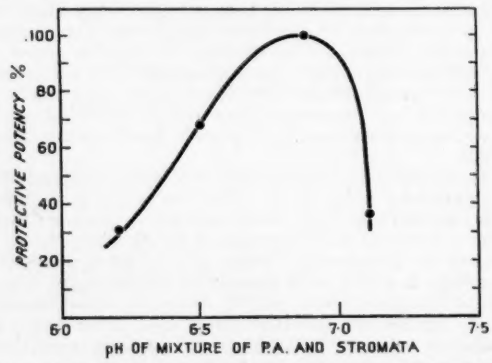

Fig. 3—Protective potency of S.P.A. prepared by interaction of P.A. and stromata at different pH values; other conditions constant.

After sonic treatment 1 part of Eagle's solution (sodium chloride 17·0 g., potassium dihydrogen phosphate 1·36 g., sodium hydroxide 0·35 g., distilled water 100 ml.; pH 7·35 ± 0·05) was added to 19 parts of the disintegrated suspension maintained at 1°C, giving an ionic strength of 0·15 and a pH value of 7·05 ± 0·05. The suspension was left at 1°C for 12–24 hr., and the insoluble residue was removed by centrifugation at 1°C for 2 hr. at 4000 r.p.m. The precise control of pH at this stage was important because a reduction of the pH value below 6·8 led to the precipitation of P.A. with the insoluble residue.

INTERACTION OF P.A. WITH STROMATA

Experiments were made to determine the ideal conditions for the combination of P.A. with stromata. Clarified sonic extract was mixed with 50% autoclaved stromata in different proportions at different ionic concentrations, pH values, and periods of incubation of the mixture. Incubation was at 37°C because experiments showed that at this temperature the combination of P.A. and stromata was complete in about 1 hr. (fig. 2). After incubation the mixtures were centrifuged at 4000 r.p.m.

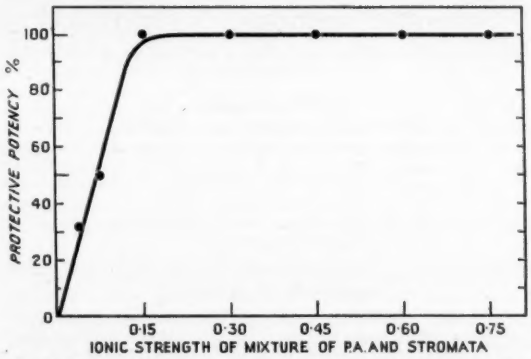

Fig. 4—Protective potency of S.P.A. prepared by interaction of P.A. and stromata at different ionic strengths ; other conditions constant.

at 1°C for 1–2 hr. The supernatant fluids were discarded, and the residues were suspended uniformly to the desired concentration in glycine-phosphate buffer at pH 7·4 (9 parts of 0·3 *M* glycine and 1 part of *M*/15 phosphate buffer) containing 1/10,000 thiomersalate.

The results of some of the experiments are summarised in figs. 3–5, from which the following conclusions were drawn :

(1) P.A. combined with stromata at pH 6·85 ± 0·05 and slight deviations from this pH produced a less potent preparation of S.P.A. (fig. 3).

(2) P.A. combined with stromata at an ionic strength of 0·15 or more, and ionic strengths less than 0·15 retarded combination (fig. 4).

(3) The most active preparations of S.P.A. were obtained when 30 parts or less of P.A. were added to 1 part of 50% stromata suspension (fig. 5).

LARGE-SCALE PREPARATION OF S.P.A.

As a result of these experiments the following procedure was decided on for the large-scale preparation of S.P.A. We consider that this procedure should be rigidly followed to obtain reproducible results, since slight deviations, which may seem insignificant, cause a decrease in the yield, purity, and antigenic potency of the final product.

(1) The growth of *H. pertussis* in modified Cohen and Wheeler medium was centrifuged at 4000 r.p.m. for 1 hr. at 1°C.

(2) The deposit was washed five times with large volumes of distilled water at 1°C.

(3) The washed bacteria were suspended to 500 × 10^9 organisms per ml. in distilled water at 1°C.

(4) The suspension in 60 ml. amounts was subjected to disintegration at 1° ± 1°C in the Raytheon type R-22-1 sonic oscillator for 40 min., or in 130 ml. amounts for 2 hr.

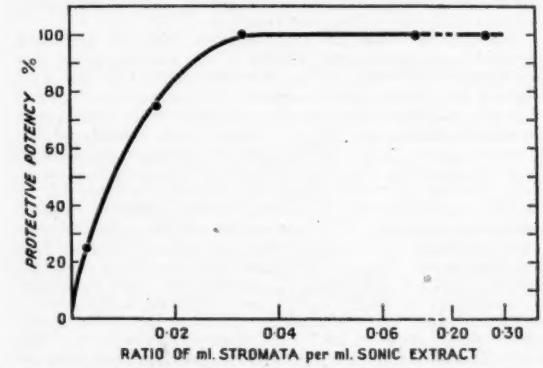

Fig. 5—Protective potency of S.P.A. prepared by interaction of different proportions of stromata and extract ; other conditions constant.

(5) To 19 parts of sonic disintegrated suspension 1 part of Eagle's buffer solution was added, and the final pH was adjusted, if necessary, to 7·05 ± 0·05.

(6) The buffered disintegrated suspension was allowed to stand overnight at 1°C and then centrifuged at 1°C for 2 hr. at 4000 r.p.m. The deposit was discarded.

(7) To 30 parts of clear extract at pH 6·85 ± 0·05, 1 part of 50% autoclaved stromata suspension was added, and the mixture was incubated in a water-bath at 37°C for 2 hr.

(8) The stromata-extract mixture was centrifuged at 1°C for 2 hr. at 4000 r.p.m. The supernatant fluid was discarded.

(9) The deposited S.P.A. was suspended in glycine-phosphate buffer at pH 7·4 containing 1/10,000 thiomersalate.

(10) The suspended S.P.A. in 100 ml. amounts was subjected to sonic vibration at 1° ± 1°C in the Raytheon type R-22-1 sonic oscillator for 30 min. to produce a homogeneous suspension.

PROPERTIES OF LARGE-SCALE PREPARATIONS OF S.P.A.

This procedure yielded stable and sterile preparations of S.P.A. which protected mice against intracerebral infection with *H. pertussis*. Typical protocols are given in the accompanying table of tests made on two different

COMPARISON OF PROTECTIVE ACTION OF 2 BATCHES OF S.P.A. WITH U.S. NATIONAL INSTITUTE OF HEALTH REFERENCE VACCINE N.I.H.4

Preparation	Dose inoculated (ml.)	Proportion of mice surviving after challenge
S.P.A. (batch 51200–35)*	1/21	54/63
	1/105	29/64
	1/525	15/64
N.I.H.4	1/6·7	41/63
	1/33·5	19/62
	1/167·5	6/64
S.P.A. (batch 7–1175–11)*	1/21	28/32
	1/105	18/32
	1/525	5/32
N.I.H.4	1/6·7	24/32
	1/33·5	8/32
	1/167·5	5/32

* Equivalent to 100 × 10^9 organisms per ml.

batches of S.P.A. in comparison with the National Institutes of Health reference vaccine. These batches were made up equivalent to 100 × 10^9 organisms per ml., and the results indicated that each batch was from four to six times as potent as the reference vaccine.

Tests made with S.P.A. heated at 56°C for 1 hr. indicated that such treatment did not reduce the protective potency. Other experiments showed that S.P.A. remained stable for fifteen months at 1°C and for six months at 37°C, although it was readily inactivated at 100°C.

S.P.A. was shown to be non-toxic. The intravenous injection of 1 ml. of S.P.A. made up equivalent to 250 × 10^9 bacteria was tolerated by mice and by guinea-pigs, and 5 ml. by rabbits, without showing any harmful effects.

No attempts were made to characterise S.P.A. completely. Electrophoretic analyses of extracts before and after addition of stromata showed no alteration in the distribution or mobilities of the electrophoretic components, and no difference was detected in the nitrogen content of extracts before and after addition of stromata. These observations indicate that P.A. represented only a minute proportion of the organism, probably less than 1% of the nitrogenous material in the extract.

Discussion

Although the nature of P.A. is not yet known, certain information about its properties is evident. It appears to be firmly associated with the bacterial cell and not loosely attached to the cell surface. Bacteria which were washed many times before they were subjected to sonic disintegration yielded high concentrations of P.A. The

extraction of P.A. from the cell by sonic disintegration and separation from the extract by stromata was largely quantitative; for under optimal conditions the protective potency of S.P.A. was very similar to that of the parent bacterial suspension. P.A. is probably not associated with pertussis hæmagglutinin (Keogh and North 1948), since this latter antigen does not protect mice against intracerebral infection (Masry 1952). Moreover the strain used produced only small amounts of hæmagglutinin, and this antigen has not been detected in preparations of S.P.A. It is also evident that P.A. is not associated with pertussis toxin (Evans and Maitland 1937); preparations of S.P.A. were unable to kill mice on intravenous injection or to produce dermonecrosis in rabbits. Finally, P.A. is not associated with pertussis agglutinogen. D. G. Evans and F. T. Perkins (private communication) have recently shown that S.P.A., tested by the agglutinin-production method (Evans and Perkins 1953), produced little or no agglutinin in mice. Although there is little or no evidence of an association between P.A. and the other known antigens of *H. pertussis*, there is some evidence that P.A. may be concerned with the ability of the organism to sensitise mice to histamine. Margaret Pittman (private communication) has recently shown that S.P.A. produced in mice a sensitisation to histamine similar to that produced by whole bacterial vaccines. This is interesting because the power to render tissues sensitive to histamine and the protective potency of bacterial vaccines have been shown to be very closely correlated (Pittman 1951).

The question of the efficacy of S.P.A. as a prophylactic against whooping-cough can only be answered by controlled trials, which are now in progress. If such trials prove that S.P.A. is effective, a more extensive investigation of the nature of the antigen is undoubtedly justified.

Summary

An investigation was made of the factors which influence the liberation of a protective antigen (P.A.) from *H. pertussis*, and of the conditions required for the formation of a stromata-protective antigen complex (S.P.A.).

A method is outlined for the large-scale production of S.P.A. The method involves the extraction of P.A. from *H. pertussis* by sonic disintegration and the removal of P.A. from the extract by the addition, in suitable proportions, of autoclaved stromata under controlled conditions of temperature, pH, and ionic strength.

Preparations of S.P.A. prepared for clinical trials have been tested in comparison with the U.S. National Institutes of Health reference pertussis vaccine and shown to be effective in protecting mice against intracerebral infection with *H. pertussis*.

We are indebted to Dr. Margaret Pittman, of the National Institutes of Health, Bethesda, Maryland; Dr. Pearl L. Kendrick, of the School of Public Health, University of Michigan, Ann Arbor, Michigan; Dr. Grace Eldering, of the Michigan Department of Health, Grand Rapids, Michigan; Miss Frances L. Clapp and Miss Frances W. Bingham, of Lederle Laboratories, for conducting many mouse-protection tests; and to Dr. H. D. Piersma and Mr. W. S. Hammond, of Lederle Laboratories, for generous supplies of *H. pertussis* specially grown for this investigation, which was supported by a grant from Lederle Laboratories Division, American Cyanamid Company, Pearl River, New York.

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CHRONIC SUBDURAL HÆMATOMA

MENTAL CHANGE AS THE PRINCIPAL CLINICAL FEATURE

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IT is well known that mental changes are often produced by a subdural hæmatoma, but when such changes occur in the absence of a history of trauma to the head, and when there are no abnormal neurological signs initially, the diagnosis of subdural hæmatoma is difficult.

Case-report

A publican, aged 59, was admitted to Hammersmith Hospital on Aug. 7, 1952, under the care of Dr. Purdon Martin. In the past he had suffered many minor ailments and had attended the hospital on several occasions for numerous vague symptoms. During the first world war, 34 years before admission, he had "shell shock" and as a result spent a year in hospital. During this time he complained of incessant headaches but made a satisfactory recovery. No further details of this illness could be obtained. Since then he had occasionally experienced headaches that were neither persistent nor severe. His wife said that, apart from being abnormally preoccupied with the state of his health, there had been no mental change in the past. He did not usually drink heavily, but recently he had been drinking more than usual. The family history contained no relevant information. Five weeks before admission he began to have headaches, and at first thought these were the same as he had experienced previously. A bifrontal ache with a sensation of pressure on the vertex was constantly present, occasionally disturbing sleep. Stooping sometimes aggravated it, but there was no nausea, vomiting, vertigo, or visual disturbance. A change of glasses gave no relief, and analgesics eased the pain only temporarily.

On examination his general condition was good, and despite his pale skin the blood picture was normal. He lay in bed with his eyes closed and gently rocked his head from side to side, giving an impression of intense suffering. He gained a great deal of sympathy from his fellow patients and he obviously enjoyed and sought this. He was alert and able to give an adequate history as well as coöperate in all the tests used. There was no defect of intellect or of memory, and his personality was unimpaired. The central nervous system was entirely normal. The blood-pressure was 140/90 mm. Hg, and his cardiovascular and other systems showed no abnormalities.

Investigations.—Radiographs of the skull and of the chest were normal. Cerebrospinal fluid (C.S.F.) under a pressure of 100 mm. of water contained 2 lymphocytes per c.mm., and protein 30 mg. per 100 ml. The Lange reaction was normal, and the Wassermann reaction was negative. The Wassermann reaction of the blood was also negative.

Progress.—In view of the complete lack of abnormal physical signs, the normal results of the investigations, and the patient's previous history, it was thought that his state was not due to an organic lesion of the nervous system. His wife was not unduly surprised at this conclusion, feeling that his present illness was "all in his mind" and probably related to recent business difficulties. He was therefore encouraged to get up, and for a few days the headaches seemed to subside. This, however, was only temporary, and soon he could not be coaxed from his bed. It was now evident that his mental state was changing. He became drowsy but could always readily be roused to coöperate fully. At times he was confused and disoriented. He talked incoherently and in a rambling fashion, with a tendency to perseverate. He exhibited amnesia and mild euphoria, at times displaying a childishness and fatuousness hitherto foreign to him. He would make bizarre facial grimaces and often muttered to himself. The headache was still present but did not seem to have become worse. At this time, and throughout the nineteen days that had elapsed since his admission, no abnormal signs were

detected in the central nervous system, despite careful and regular observation. A psychiatric opinion was then sought, and it was considered that he presented an organic syndrome characteristic of progressive cerebral deterioration. The diagnosis seemed to lie between a type of presenile dementia and chronic alcoholic deterioration. Admission to an observation ward was advised, and arrangements for this were being made when, on Aug. 29, 1952 (three weeks after admission), the patient suddenly developed an acute pulmonary infection. Three days later, while his chest condition was responding to treatment, his mental state had deteriorated further. He had periods of great restlessness, and satisfactory contact with him was impossible. He still complained of headache, but his speech was mostly incoherent and often incomprehensible. At times he was very drowsy but he could always be aroused without difficulty and he was never comatose nor incontinent. The C.S.F. pressure was so low that it could not be recorded; it was normal in content. Four days later, on Sept. 5 (thirty days after admission), abnormal neurological signs were detected for the first time. There was definite falling away of the right arm when both were outstretched, the reflexes were slightly increased on the right side, and both plantar reflexes were weakly extensor. Since he might have had a frontal neoplasm or possibly a subdural hæmatoma, he was transferred to a neurosurgical unit (Mr. Geoffrey Knight) where, on the same day, 30 ml. of old blood was evacuated from the subdural space on each side. It was thought that it had probably been present less than six months. He made a very rapid and gratifying recovery: a week after the operation he was free from all headache, bright and alert, and no longer confused or disorientated. In fact he was an entirely different person; instead of being dull and complaining he was now likeable and jovial. He now said that during his work he frequently had to pass beneath a low-beamed door and often knocked his head against the lintel. At no time, however, had he been rendered unconscious, and he did not recall any particularly severe blow before the onset of his headaches. Intellectual testing and assessment of his personality, as well as examination of his nervous system, revealed no abnormalities, and he was discharged on Oct. 13, 1952. When seen a year later, he had returned to his work and had no complaints at all.

Initially there was no history of head injury, and even on direct questioning after operation there was only a vague story of repeated trivial blows, reminiscent of Trotter's (1914) second patient in whom there was the same type of trauma to the head. Many years previously our patient had had a psychiatric illness which included severe headaches, and in the ensuing years had experienced many illnesses, some of which were without an organic basis. He was known to be anxious and hypochondriacal, and when headaches returned as the first manifestation of the subdural hæmatoma it was thought that they were functional. Despite repeated and careful examination no clinical abnormalities were found in the central nervous system, and the appropriate special investigations gave normal results. Only late in the illness did signs of focal cerebral involvement develop, and at no time was there any indication of increased intracranial pressure. After the subdural clots had been removed, the patient recovered completely.

Discussion

All writers agree that mental disturbances are among the most common manifestation of chronic subdural hæmatomas, yet this fact is rarely mentioned in textbooks on psychiatry. Admittedly, in most cases the symptoms and signs are sufficient to warrant a tentative diagnosis, but rarely is the clinical picture mainly psychiatric.

INCIDENCE OF MENTAL CHANGES

The incidence of mental changes has been assessed very differently by different writers, the more reliable figures being 21·2% of 48 cases (Kunkel and Dandy 1939), 75% of 50 cases (Krayenbühl and Noto 1949), 86% of 44 cases (Jelsma 1930), and in all of 50 cases (Wortis et al. 1945). Trotter (1914) emphasised the mental changes and believed that they occurred in many, if not all, cases of subdural hæmatoma. This notion was corroborated by Coleman (1935), who said that, in cases of subdural clot, changes in mental state are found "perhaps oftener than in any space-occupying lesion of the brain."

The figures given by different authors depend partly on their conception of the term "mental changes" and partly on the thoroughness with which they are sought. Wortis et al. (1945) examined their cases very carefully and found mental changes in all of them. On the other hand, although we agree with Abbott et al. (1943) that psychiatric estimation is important in all cases of chronic subdural hæmatoma it is, in our view, by no means the major aspect of the clinical problem, as these workers would have us believe.

It is well known that there is a high incidence of subdural hæmatoma among inmates of mental institutions coming to necropsy. Allen et al. (1940) found 245 (7·9%) in 3100 consecutive necropsies on psychotics, exactly the percentage recorded by Lewis (1889). In only 35 of the cases of Allen et al. (1940), however, was the subdural hæmatoma the primary cause of death, and it was impossible to say in how many patients the psychosis was due to the subdural clot. That epileptics and alcoholics have a greater liability to head injuries, and that cerebral changes in arteriosclerotics and neurosyphilitics may predispose to subdural hæmatoma, is admitted by Allen et al., and such conditions are probably all-important in these cases.

Another cause to be considered is the form of therapy used. The schizophrenic reaction in Singh's (1950) patient may have been produced by a subdural hæmatoma precipitated by electroconvulsive therapy; and Furlow (1939) blames insulin-shock therapy in his case 2. These forms of therapy, however, seem to be less likely causes of subdural hæmatoma, which has not so far been reported as a complication of these widely used procedures. The reason why only certain patients with subdural hæmatomas manifest prominent mental changes is explained best by Lewis (1946): any disturbance of the brain, whether it be head injury, anæmia, toxic agents, or focal lesion, if severe enough, will interfere with the mental state and so produce a type of mental reaction typical of an organic lesion. But some people are more loosely integrated in their personality, being "oriented toward psychosis" (Lewis 1946); their past history may readily illustrate this; they break down mentally more readily and much more extensively under stress than the more intact person, and psychiatric features dominate the clinical picture.

TYPES OF MENTAL CHANGES

Wortis et al. (1945) have carefully analysed the mental disturbances in patients with acute or chronic subdural hæmatoma. They recognised that it was difficult to exclude other coexisting traumatic cerebral lesions that would complicate the clinical picture. However, in a series of 50 cases, they divided the preoperative mental changes into groups which included changes in the state of consciousness and in mood and disturbance of the sensorium and of thinking. They found that in each of their patients there was some mental abnormality. Like other workers, they included disordered states of consciousness which are present in all cases at one time or another and should perhaps be considered separately. The high incidence (86%) of mental changes in Jelsma's (1930) collected series, for example, is probably explained by the inclusion of drowsiness and the various stages of coma.

The commonest psychological findings of Wortis et al. (1945) were progressive confusion and disorientation (present in two-thirds of cases), emotional dullness, irritability, and uncoöperativeness (in a quarter of cases), and a general reduction in mentation. de Morsier (1937) mentioned a similar rather non-specific constellation of mental changes, which are often included in the term "dementia." Depression, euphoria, delirium, hallucina-

CASES OF CHRONIC SUBDURAL HÆMATOMA WITH MENTAL CHANGE AS PRINCIPAL CLINICAL FEATURE

Reference	Sex	Age (yr.)	Presenting symptoms	Mental features	Duration to operation or death	Findings at operation	Outcome
Trotter (1914) case 2	M	41	"Strange manner"	Absent-minded; lack of initiative	?	Left-sided hæmatoma	Complete recovery
Martin (1931) ..	M	52	Headaches	Vague; poor memory; repetitive	5–6 mos.	..	Death; hæmatoma not described in detail
Furlow (1936) case 8	M	45	Irritability, with suicidal tendencies	Poor memory; disoriented	10 mos.	..	Death; right-sided hæmatoma
Olkon (1938) ..	M	37	Acute confusional state	Paranoia; hallucinations and delusions	11 days (see text)	Dark subdural blood	Complete recovery
Furlow (1939) case 1	M	63	Mental changes	Dementia with sexual aberrations; irritable	3 yr.	Right-sided hæmatoma	Complete recovery
Furlow (1939) case 3	M	48	Headache and vomiting	Hallucinations	4 mos.	Right-sided chronic hæmatoma	Slow but complete recovery
Fleiss (1945) ..	M	56	Manic-depressive psychosis	..	2 mos. (see text)	Left-sided hæmatoma	Several relapses but eventual recovery
Whitfield (1946) case 1	M	32	"Peculiar behaviour"	Transient amnesia	? 7 yr. (see text)	Left frontal hæmatoma	Complete recovery
Clarke and Cooper	M	59	Headache	Confusion; disorientation; mental deterioration	2 mos.	Bilateral hæmatoma	Complete recovery

tions, and delusions, on the other hand, were rare. Confusion tends to be more severe in the older patients; and alterations in personality, particularly in the patient's attitude to his work and family, are important. Wortis et al. (1945) emphasised the diagnostic importance of the steady progression of mental deterioration—an event that was witnessed in the present case. Krayenbühl and Noto (1949) mentioned disorders of affect, lack of initiative and critical judgment, weakness, and apathy as common mental disturbances. Homburger (1905) described a patient with a Korsakoff type of psychosis produced by a subdural hæmatoma, and Kasemeyer's (1911) patient was thought to have a post-traumatic neurosis. Among the 50 cases of Krayenbühl and Noto (1949) there were 2 (cases 4 and 46) displaying features of a frontal-lobe lesion. There were also physical abnormalities present, and the cases reported by Petit-Dutaillis et al. (1953) were similar. The case of Micheels (1953) is the only one in which a catatonic state was a prominent feature.

Thus, just as many neurological syndromes may be produced by a subdural collection of blood, so the psychiatric disorders are likewise variable, within the organic reaction pattern.

MENTAL CHANGES AS PRINCIPAL CLINICAL FEATURE

We are particularly concerned with cases of subdural hæmatoma in which mental disturbances and headache are the sole features of the early stages of the illness, there is no evidence of head injury, and the nervous system is normal.

Trotter (1914) stated: "These mental symptoms may be perceptible even to uneducated observers, when no physical signs of interference with the brain can be detected." Ample confirmation of this statement has been produced by different workers, particularly Wortis et al. (1945), who occasionally found patients in whom the mental abnormalities far outweighed the neurological abnormalities. At least 8 cases similar to ours have been published in which the principal clinical feature at the onset was an abnormal mental state, and the nervous system and special investigations were all normal. These cases are summarised in the accompanying table.

Other cases with predominant mental changes have been recorded, but in all of them a history of trauma was readily elicited or examination revealed neurological abnormalities indicating a focal cerebral lesion (Homburger 1905; Kasemeyer 1911; Furlow 1936, case 10; Linell 1940, cases 4 and 5; Abbott et al. 1943, case 7; Matera et al. 1948, 2 cases; Krayenbühl and Noto 1949, cases 4 and 46). It is important to remember these cases when dealing with postconcussional psychotic or neurotic states, for if a subdural hæmatoma is left untreated it will almost always prove fatal; but if it is removed the results can be excellent. As mentioned already, however, the picture may be complicated by additional intracranial damage. This may have been so in case 4 of Linell (1940), where operation did not dispel the patient's mental symptoms.

Of the cases in the table mention must be made of 3. The patient of Fleiss (1945) had several manic and depressive episodes that usually coincided with the appearance of a subdural accumulation; but they did not always do so, and one cannot subscribe to Fleiss's suggestion that the clot may at times have been absorbed spontaneously. In Whitfield's (1946) first patient mental changes had been present seven years, but it is doubtful if the subdural clot was of a similar age; although recovery was complete after the removal of the hæmatoma, only further observation will determine the actual rôle of the mental features. The patient described by Singh (1950) presented with a schizophrenic reaction, and a subdural hæmatoma was found at necropsy. It was difficult, however, to correlate these two findings; as mentioned already, the possibility of the clot being a product of electroconvulsive therapy, although unlikely, could not be entirely excluded. Because of the uncertainty this case will not be considered further.

In summarising the clinical picture in the selected group of cases shown in the table, it is seen that all the patients were men. Since subdural hæmatoma occurs more often in males, this finding is of little significance in a small series. The ages varied from 32 to 63, the average being 49; if anything, there was grouping in middle and late adult life. So far as was known initially, there had been no injury to the head, although it transpired later that Trotter's (1914) second patient and ours had repeatedly sustained minor trauma. In case 8 of Furlow (1936) there was no history of head injury, but the patient was a chronic alcoholic, and radiographs and necropsy revealed skull fractures. Similarly, in Whitfield's (1946) patient, radiographs showed a fracture, although there had been no indication of trauma. The mental changes mentioned in the series were of considerable variety, no constant syndrome being observed. They usually began insidiously. In Olkon's (1938) patient the onset seemed to be acute, but it was later revealed that personality changes had preceded the acute exacerbation; the clot was found to be of long standing and therefore must have antedated the presenting confusional state. All the patients had headache, which usually began after the mental changes, and disturbances of consciousness were invariably present. The characteristic waxing and waning of consciousness was not

regularly seen but, if present, is a most helpful sign of subdural hæmatoma. The length of history varied from a few weeks to three years. Abnormal neurological signs were absent initially but appeared later in all the cases, usually accompanying the increasing drowsiness, as often happens in this condition. Apart from the drowsiness, signs of increased intracranial pressure were rare. Special investigations were of little diagnostic value. The C.S.F. was examined in 6 of the patients, and the pressure was either normal or less than normal in all of them; only 1 patient had xanthochromia, and he and another patient had an increased amount of protein in the C.S.F. Skull radiography was done in 6 cases, and, apart from the 2 patients with fractures mentioned already, they were always normal.

The preoperative diagnoses in these cases were acute psychosis, war neurosis, frontal tumour, cerebral degeneration, presenile dementia, and manic-depressive psychosis. All but 2 patients were operated on, and subdural hæmatomas of various sizes and in various positions were successfully removed. There seemed to be no correlation between the location and size of the lesion and the clinical picture, but full details of the clot were rarely available. Of the 9 cases in which mental change was the principal feature the hæmatoma was bilateral in the present case only.

Although the follow-up on most of these cases was limited and the end-results are thus unknown, the immediate postoperative recovery, both mental and physical, was rapid and usually complete. This fact emphasises the importance of being aware of this small group of cases. In any patient with severe headache who manifests progressive non-specific mental changes accompanied by increasing drowsiness, which may or may not fluctuate, a subdural hæmatoma should be considered, even in the absence of known trauma, increased intracranial tension, and abnormal neurological signs. If the drowsiness leads to coma, and abnormalities of the central nervous system appear, special diagnostic procedures and the help of a neurosurgeon are called for immediately.

Summary

A case of chronic subdural hæmatoma is described in which the major clinical feature was mental change without any history of head injury. The central nervous system appeared to be normal, as were skull radiographs and the C.S.F. Removal of the clot led to complete recovery.

The mental changes observed with subdural hæmatoma are described, and previously published cases are discussed.

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HEPATIC COMA *

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A NEUROLOGICAL syndrome termed "episodic stupor" has been observed in patients who have undergone portacaval anastomosis. This syndrome has been shown to be caused by ammonia intoxication (McDermott and Adams 1954). The similarity of "episodic stupor" to hepatic coma is striking, since the neurological disturbances are similar to, and the electro-encephalographic changes identical with, those observed in patients with liver disease who are in a state of stupor or coma (Adams and Foley 1949, Foley et al. 1950).

Because of this similarity between episodic stupor resulting from a portacaval anastomosis and the syndrome of hepatic coma, we have investigated the ammonia metabolism of patients with liver disease. Other investigators have reported changes of the blood-ammonia level in liver disease (Burchi 1927, Caulaert et al. 1932, Fuld 1933, Kirk 1936, Gaustad 1949), but the results of their studies have been inconclusive and have not established ammonia as an ætiological factor in hepatic coma.

A syndrome indistinguishable from hepatic coma has been reported to follow the administration of an ammonium-containing cation-exchange resin to patients with cirrhosis of the liver (Gabuzda et al. 1952). Later Phillips et al. (1952) reported their findings in a group of 9 alcoholics with advanced cirrhosis who were given various nitrogenous substances. Five substances were given by mouth: ammonium chloride, diammonium citrate, an ammonium-potassium exchange resin, urea, and a high-protein diet. A condition resembling the onset of hepatic coma occurred in 5 of the 9 patients studied. The blood-ammonia levels were estimated, but the correlation between the blood-ammonia level and the abnormal signs was not consistent enough to establish a direct relationship.

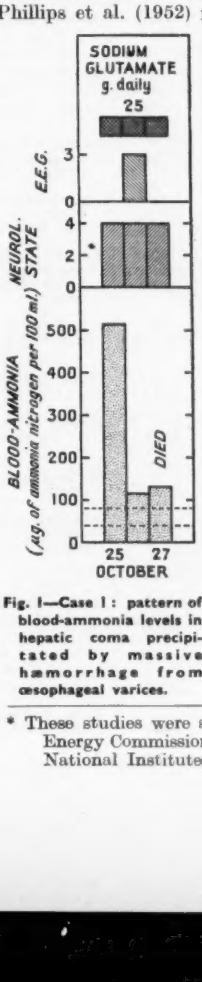

Fig. 1—Case 1: pattern of blood-ammonia levels in hepatic coma precipitated by massive hæmorrhage from œsophageal varices.

Walshe (1951, 1953) suggests that hepatic coma may be due to an intracellular disturbance of ammonia metabolism, and that in hepatic coma the normal ammonia-binding mechanism of the brain-cell, the combination of glutamic acid with ammonia to form glutamine (Weil-Malherbe 1950), is disturbed. This theory is supported by the observation that glutamic-acid therapy led to the recovery of 3 patients who between them had five episodes of hepatic coma (Walshe 1953).

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In our investigation the peripheral blood-ammonia levels were determined in patients with hepatic coma, and the effect of glutamic acid on both clinical symptoms and blood-ammonia levels was studied.

Methods

The patients were under observation in the wards of the Massachusetts General Hospital. They were seen daily, often more frequently, when their neurological status was assessed and their peripheral blood-ammonia levels were determined. None of the patients had undergone portacaval anastomosis.

To correlate the mental state and the biochemical findings, the degrees of alertness and reactivity were graded on a scale from 0 to 4. Normal mental function was recorded as 0, coma as 4, the slightest alteration of mental function as 1, severe mental confusion or disorientation as 2, and stupor and semicoma as 3.

The electro-encephalographic changes were graded from 0 to 3, zero meaning normal. This scheme of reporting the neurological and electro-encephalographic changes has already been published in detail (McDermott and Adams 1954).

Blood-ammonia levels were determined by a modification (McDermott and Adams 1954) of the Conway (1950) microdiffusion technique which shows the ammonia level in the peripheral venous blood of normal people to be 55·6 (44·0–71·0) μg. of ammonia nitrogen per 100 ml. There is evidence that abnormally high levels of ammonia nitrogen in the blood reflect changes in the actual free ammonia level in the blood (McDermott and Riddell 1954).

The sodium glutamate for intravenous use was prepared by the method of Mayer-Gross and Walker (1949) and given in doses of 25 g. A few patients were treated with intravenous sodium succinate in doses of 10 g.

Results

The results of studies made on 29 patients with hepatic coma or pre-coma are summarised in the accompanying table. Patients with hepatic coma have a high blood-ammonia level related to the severity of their symptoms. The pattern of the blood-ammonia levels varies, but two predominant types are illustrated by the following case-histories :

Case 1.—A chronic alcoholic woman, aged 47, vomited a pint of blood on the eve of admission to hospital. Next

SUMMARY OF STUDIES ON PATIENTS WITH HEPATIC COMA

Case no.	Age (yr.)	Sex	Diagnosis	Days under observation, and outcome	Neurological state	Blood-ammonia levels (μg. per 100 ml.)	Comments
1	47	F	Alcoholic cirrhosis; bleeding œsophageal varices	3 Died	Within 12 hr. of onset progressed to deep coma with convulsions	518–115	Treatment with intravenous sodium glutamate was followed by fall of blood-ammonia level, but patient did not improve
2	39	M	Alcoholic cirrhosis	8 Died	Admitted in gross confusion, progressed to coma and death	463–189–235	Died in hepatic coma after temporary fall in blood-ammonia level accompanied by transient clinical improvement
3	62	M	Alcoholic cirrhosis; bleeding œsophageal varices	1 Died	Drowsy and confused	451	Died of massive hæmorrhage within 12 hr. of onset
4	52	M	Alcoholic cirrhosis; bleeding œsophageal varices	48 Recovery	Admitted in coma precipitated by hæmorrhage	412–53	Treatment with intravenous sodium succinate was followed by recovery for four days, but patient died of postoperative sepsis
5	49	M	Alcoholic cirrhosis; pulmonary tuberculosis	9 Died	Increasing drowsiness progressing to coma and death	76–408	Died of hepatic coma with rising blood-ammonia level
6	71	M	Alcoholic cirrhosis	18 Died	Recurrent attacks of stupor; improved temporarily and later died in coma	146–396	Terminal episode despite restriction of protein
7	49	M	Alcoholic cirrhosis	32 Recovery	Recurrent attacks of drowsiness and confusion with development of flapping tremor	393–142	Attacks related to high-protein intake associated with rise in blood-ammonia level
8	42	M	Alcoholic cirrhosis; bleeding œsophageal varices	16 Recovery	Admitted in coma which had lasted 12 hr.	385–94	Blood-ammonia level fell off rapidly
9	24	F	Acute virus hepatitis	4 Died	Stuporous when first seen, progressive deterioration	232–383	Treated with intravenous sodium glutamate
10	54	F	Hæmochromatosis	11 Died	Became progressively worse during study and died in coma	92–380	Progressive deterioration with rising blood-ammonia level despite sodium glutamate and succinate
11	55	M	Alcoholic cirrhosis	6 Died	In deep coma throughout study	272–374	Coma probably induced by high-protein diet
12	38	F	Alcoholic cirrhosis	3 Died	Admitted in deep coma and continued in this state until death	300–355	On one day treatment with sodium glutamate 25 g. was followed by fall of blood-ammonia level to 155 μg. per 100 ml. without clinical improvement
13	41	M	Alcoholic cirrhosis; bleeding œsophageal varices	95 (2 admissions) Died	Normal except for one episode of semicoma lasting 3 days	(1) 75–106 (2) 219–59–343–76–275–122	219 at onset semicoma, 343 no symptoms; probably related to high-protein diet; died from postoperative sepsis
14	62	F	Portal cirrhosis	15 Died	Progressive deterioration ending in coma and death	51–333	On high-protein diet
15	47	M	Alcoholic cirrhosis; bleeding œsophageal varices	8 Died	Varied between semicoma and deep coma during study	147–312	Progressive deterioration with rising blood-ammonia level

morning, Oct. 25, 1953, her husband noticed that she was drowsy and arranged for her admission. During the next six hours she became increasingly worse until she was maniacal and finally lapsed into deep coma.

On admission in the maniacal stage her blood-ammonia level was 518 μg. of ammonia nitrogen per 100 ml. She was treated with intravenous dextrose, aureomycin, and sodium glutamate but in spite of this therapy remained in deep coma until death (fig. 1), although her blood-ammonia level fell to a relatively low figure—115 μg. of ammonia nitrogen per 100 ml.

Comment.—There are several interesting features in this case. If the patient's blood-ammonia level had not been determined before the second day, no relationship between her neurological condition and blood-ammonia level would have been apparent. This pattern of blood-ammonia levels has been observed also in cases 4, 7, 8, 21, and 24, who all recovered from their coma, but none had such a high initial blood-ammonia level.

Case 1 appears to have had a syndrome comparable to that seen in dogs and humans with Eck fistulæ, where it has been shown that a rise of blood-ammonia level induces symptoms which persist after the blood-ammonia level has fallen to nearly normal (McDermott and Adams 1954, Riddell et al. 1954).

Case 5.—A chronic alcoholic man, aged 49, was admitted to hospital on Sept. 23, 1953, with two months' history of abdominal swelling. A year earlier he had been treated in another hospital for portal cirrhosis with ascites.

On examination he was wasted and jaundiced; his abdomen was grossly distended with fluid, his liver was enlarged, and he had severe bilateral pulmonary tuberculosis, with tubercle bacilli in his sputum. Liver-function tests on Sept. 24 showed total serum-protein 5·3 g. per 100 ml. (albumin 1·1 g. per 100 ml.); and total serum-bilirubin 3·3 mg. per 100 ml. There was no neurological abnormality on admission, but on Oct. 2 the patient became drowsy. His condition became progressively worse, and on Oct. 7 he went into deep coma and remained in this state until he died on Oct. 10 (fig. 2).

Comment.—The pattern of a progressive rise in blood-ammonia level (fig. 2) is that seen in patients with terminal hepatic failure (see table). The blood-ammonia level rose from an initial reading of 76 μg. of ammonia nitrogen per 100 ml. on Oct. 2 to 408 μg. per 100 ml. on Oct. 7, then fell on Oct. 8, but rose again next day, and on the day of his death (Oct. 10) was 313 μg. per 100 ml. The administration of relatively large amounts of protein may have contributed to his death. The rise in the blood-ammonia level followed an oral intake of

SUMMARY OF STUDIES ON PATIENTS WITH HEPATIC COMA—*continued*

Case no.	Age (yr.)	Sex	Diagnosis	Days under observation, and outcome	Neurological state	Blood-ammonia levels (μg. per 100 ml.)	Comments
16	26	M	Cirrhosis with ulcerative colitis	9 Died	Drowsy on admission, died in coma	103–311	Temporary improvement on intravenous sodium glutamate, with fall in blood-ammonia level
17	66	M	Alcoholic cirrhosis	9 Died	Drowsy, confused about place and time	131–300	Precipitated by ammonium chloride; temporary lowering of blood-ammonia level to 73 μg. per 100 ml. after treatment with intravenous sodium glutamate, with improvement; died of coronary thrombosis
18	44	M	Cirrhosis; hæmochromatosis; bleeding œsophageal varices	40 Recovery	Became comatose after hæmorrhage; recovered rapidly	88–291–146	Highest blood-ammonia level preceding coma 203 μg. per 100 ml.; died of recurrent hæmorrhage from varices
19	43	F	Alcoholic cirrhosis	22 Recovery	Drowsy and confused with flapping tremor	290–134	Recovery with fall in blood-ammonia level after therapy with intravenous sodium glutamate
20	43	M	Alcoholic cirrhosis; bleeding œsophageal varices	5 Died	Increasing drowsiness progressing to semicoma	138–285	Died from hæmorrhage on fifth day
21	65	F	Alcoholic cirrhosis	3 Died	In semicoma, responding to painful stimuli only	253–131	Coma precipitated by course of ammonium chloride; given intravenous sodium glutamate on admission; this was followed by improvement with fall in blood-ammonia level; patient died suddenly of brain-stem hæmorrhage; no necropsy
22	52	F	Postnecrotic scarring; bleeding œsophageal varices	11 Recovery	First seen in deep coma; recovery	252–82	Treated with intravenous sodium glutamate and succinate; recovered from coma; died later from post-operative pulmonary œdema
23	67	M	Portal cirrhosis; bleeding œsophageal varices; polycythæmia vera	2 Died	Two days before study patient started to bleed, rapidly passed into coma, and died	250–167	Not seen until in coma; given intravenous sodium glutamate on day of death
24	53	M	Alcoholic cirrhosis	31 Died	Drowsy during part of study	95–245–96	Died of pneumonia; peak blood-ammonia level coincided with onset of neurological symptoms
25	57	M	Portal cirrhosis; bleeding œsophageal varices	20 Recovery	For one day very drowsy after transœsophageal ligation of varices	214–25	
26	55	M	Alcoholic cirrhosis	7 Recovery	Confused and disoriented	195–100	Improvement coincided with fall in blood-ammonia level
27	43	M	Alcoholic cirrhosis; bleeding œsophageal varices	2 Died	Admitted in deep coma, improved on therapy	169–108	Improvement followed treatment with intravenous sodium glutamate; blood-ammonia level not estimated before therapy started; patient died of uncorrected hypokalæmic alkalosis
28	34	M	Alcoholic cirrhosis; bleeding œsophageal varices	2 Died	In deep coma when first seen; died next day	158–132	Blood-ammonia level not determined until after patient had been in coma 24 hr.
29	40	M	Alcoholic cirrhosis	2 Died	In semicoma for a week before study; died in coma	103–129	Patient seen only 48 hr. before death blood-ammonia level not estimated at onset of coma.

120 g. of protein on Oct. 5; and the highest blood-ammonia level of 408 μg. per 100 ml. corresponded to an intake of 85 g. of protein on Oct. 7.

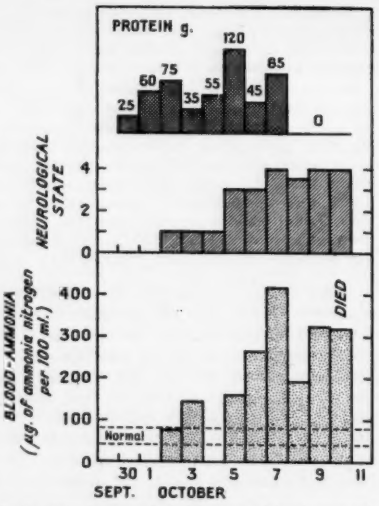

Fig. 2—Case 5: correlation between blood-ammonia level and neurological state in terminal hepatic failure. Electro-encephalography was not done.

Case 9.—A woman, aged 24, received a blood-transfusion for post-partum hæmorrhage four months before admission on Dec. 11, 1953. She was well until nine days before admission, when she first became ill with malaise, nausea, and vomiting; two days later she became jaundiced.

On admission she was deeply jaundiced, drowsy, and disoriented. Apart from these findings physical examination was negative. Over the next two days her condition became worse; she was very drowsy and slept unless stimulated, when, if roused, she was disoriented and excitable. Treatment was started with cortisone 400 mg. daily.

Subsequent Progress.—On Dec. 14 she was stuporous but, if stimulated, she had bouts of screaming. Her blood-ammonia level was 232 μg. of ammonia nitrogen per 100 ml. On Dec. 15 she was comatose, showing only a feeble response to painful stimuli. Her blood-ammonia level was 254 μg. of ammonia nitrogen per 100 ml. in the morning. In the afternoon her physical condition was unchanged, but her blood-ammonia level had fallen to 156 μg. of ammonia nitrogen per 100 ml., and it fell still further to 74 μg. per 100 ml. after the administration of intravenous sodium glutamate 25 g. In response to the glutamic-acid therapy there was a slight clinical improvement in that, although remaining in coma, the patient reacted by feeble movements to light touch. On Dec. 16 she was in deep coma until she died soon after midnight; two hours before death muscle twitching developed. The blood-ammonia level rose from 234 μg. of ammonia nitrogen per 100 ml. in the morning to 383 μg. per 100 ml. in the afternoon. Necropsy showed acute yellow atrophy of the liver.

Comment.—This patient showed the progression of hepatic coma from stupor to deep coma, and over this period her blood-ammonia level rose from 232 to 383 μg. of ammonia nitrogen per 100 ml. Glutamic-acid therapy was associated with a transient fall in the blood-ammonia level but did not produce any definite clinical improvement.

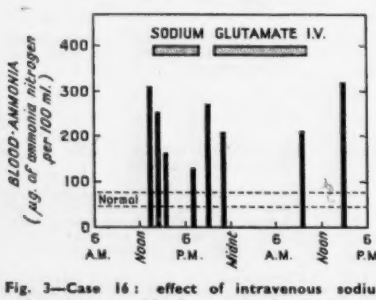

Fig. 3—Case 16: effect of intravenous sodium glutamate on blood-ammonia level. In each instance the intravenous infusion of sodium glutamate was followed by a fall in blood-ammonia level, which rose again when the infusion was discontinued.

In this investigation electro-encephalography showed changes closely correlated with the clinical and biochemical findings, and revealed that some patients with disturbed consciousness do not show the abnormal rhythm attributed to hepatic coma. In these patients the blood-ammonia level was not much raised, and they have been excluded from the series because the cause of their neurological disturbance was considered to be due to other complications of hepatic disease—e.g., electrolyte disorders, septicæmia, severe pulmonary infection, and neurological disorders associated with chronic alcoholism.

Of the 29 patients 11 were treated with glutamic acid, with the following results:

Number of patients treated	11
Number of patients who improved on therapy	6
Number of patients who recovered from hepatic coma	3
Number of patients who left hospital	1*

* 2 patients died of intercurrent disease.

To 3 patients in deep coma only one infusion of sodium glutamate 25 g. was given; all of these died without showing any improvement. Of 8 patients treated with intravenous glutamic acid in repeated doses earlier in the disease 6 improved temporarily, and 3 recovered.

We tried to obtain objective evidence of the value of glutamic-acid therapy by observing its effect on peripheral blood-ammonia levels. In all 7 cases in which this was studied the blood-ammonia level fell after the administration of glutamic acid, and in 4 patients this was followed by clinical improvement. The results of one such experiment are given in fig. 3, which shows that the blood-ammonia level fell after the administration of intravenous sodium glutamate on two occasions (between the two infusions intravenous therapy was continued with glucose). Although a temporary clinical improvement took place in this patient, his condition deteriorated and he died in hepatic coma. In this case the sodium glutamate became decreasingly effective in lowering the blood-ammonia level as the patient's condition became worse.

Discussion

In any discussion of hepatic coma it is important, first of all, to stress the concept that there is not a single disorder attendant on acute or chronic deterioration in hepatic function. The susceptibility of patients with liver disease to infection, the electrolyte disturbances associated with advanced cirrhosis, and the development of hypoglycæmic attacks in patients with cirrhosis are only a few of the disorders which may cause a variety of symptoms, including neurological disturbances. In addition, chronic alcoholism, one of the major causes of cirrhosis, has associated neurological diseases—e.g., the Wernicke-Korsakoff syndrome and delirium tremens. We are concerned here only with a specific biochemical abnormality which our observations indicate to be a cause of consistent neurological symptoms and electro-encephalographic changes, both of which may be completely reversible. In our experience most cases of so-called hepatic coma are due to this specific abnormality—ammonia intoxication.

The results reported here show a correlation between the neurological symptoms and the ammonia levels in the peripheral blood in hepatic coma in 28 patients with cirrhosis of the liver and 1 with virus hepatitis. This observation alone does not establish that ammonia intoxication causes neurological conditions, but other experimental and clinical evidence supports this concept.

Ammonia is known to be very toxic to animals; to rabbits it is lethal at a concentration of about 1 part in 20,000 (Baldwin 1952). The Eck-fistula dog, when given ammonium salts, urea, or meat, develops a neurological syndrome characterised by ataxy, amaurosis, coma, and sometimes death, which is called "meat intoxication." The episodes of intoxication are preceded by high ammonia levels in the peripheral blood, and the symptoms may persist although the blood-ammonia level has fallen to nearly normal. This syndrome can be induced by repeated small injections of intravenous urease, when

both the symptoms of meat intoxication and the same pattern of blood-ammonia levels are observed (Riddell et al. 1954).

In cirrhosis of the liver symptoms identical with those of the onset of hepatic coma have been produced by the oral administration of ammonium salts and compounds which might liberate ammonia, such as urea (Phillips et al. 1952). Treatment of hepatic coma by a method which aims at enhancing the activity of one of the mechanisms of detoxication for ammonia—i.e., glutamic-acid therapy—is effective in some cases (Walshe 1953). Our results show that glutamic-acid therapy may cause clinical improvement and its use is followed by a fall in blood-ammonia level.

It is believed that the observed changes in peripheral blood-ammonia levels in hepatic coma do not give more than a general indication of the changes in ammonia metabolism which take place in the brain-cells, where ammonia is constantly being formed and then removed by the glutamic-acid/glutamine system (Weil-Malherbe 1950).

While in "meat intoxication" in the Eck-fistula dog and the episodic stupor which sometimes follows portacaval anastomosis in man the part played by ammonia intoxication appears clear, this is not always so in patients dying of liver failure. In such patients there are commonly present other disorders which may cause changes in consciousness—e.g., electrolyte disorders, hyponatræmia, hypokalæmia, septicæmia, and severe respiratory infections. Any of these may occur in association with ammonia intoxication.

Our experimental findings do not warrant a discussion of the treatment of hepatic coma, but certain observations may be made. First, we must emphasise again the observations of Davidson and his co-workers (Gabuzda et al. 1952, Phillips et al. 1952) on the potential dangers of a high-protein diet and of ammonium-containing compounds in decompensated liver disease; but the therapeutic value of protein in compensated liver disease must also be emphasised. Glutamic-acid therapy in hepatic coma has not yet been proved to be of value. In patients with terminal hepatic failure little can be expected except some temporary improvement, but in patients in whom the symptoms are due to relatively mild ammonia intoxication the chances of recovery may be enhanced by treatment with glutamic acid, whose greatest usefulness may be in patients showing evidence of impending coma after hæmorrhage from œsophageal varices.

Summary and Conclusions

In hepatic coma the metabolism of ammonia is deranged.

The evidence for the existence of ammonia intoxication in hepatic coma is discussed, and it is believed that it is sufficient to base therapy on this concept of ammonia intoxication.

The place of glutamic-acid therapy in hepatic coma is discussed.

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THE TREATMENT OF ERYTHROBLASTOSIS FŒTALIS WITH Rh HAPTEN

REVIEW OF A HUNDRED CASES

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THE suggestion that erythroblastosis fœtalis, fœtal œdema, icterus gravis neonatorum, and anæmia of the newborn were manifestations of a single disease was first put forward by Diamond, Blackfan, and Baty (1932). Darrow (1938) suggested that this disease was caused by destruction of fœtal red cells by some immunity reaction. Levine and Stetson (1939) reported an agglutinin in the blood of a mother delivered of a dead fœtus; this antibody had properties similar to those of agglutinins which had been produced in rabbits by the injection of red cells of *Macacus rhesus* (Landsteiner and Wiener 1940).

From this beginning has expanded our modern concept of erythroblastosis fœtalis as a disease produced by maternal immunisation to a fœtal-blood factor inherited from the father. This Rh factor has been obtained from the stroma of human red cells by Belkin and Wiener (1944) and Calvin et al. (1946). Carter (1947) reported a crude red-cell fraction which inhibits anti-D (anti-Rh_0) serum and described this in detail (1949) under the name of Rh hapten. This substance is produced from Rh-positive (pooled CDE positive) human red cells by protein precipitation with alcohol and further extraction of lipid constituents, originally with ether, at present with the non-inflammable compound dichloromethane, as suggested by Smolens (1952). 100 mg. of the substance so extracted, when mixed with 1 ml. of a potent anti-D serum and the mixture incubated at 37°C for 30 minutes, will absorb a high percentage of Rh antibodies from that serum, as determined by serum titrations and by quantitative nitrogen determinations of the washed serum-exposed fraction particles.

Present Investigation

The fraction has been injected intramuscularly into more than 500 sensitised Rh-negative pregnant women, and I report here the results obtained in the first 100 cases treated at the Western Pennsylvania Hospital in Pittsburgh. Although the clinical material is heterogeneous, consisting of cases presenting in sequence, and although many of these women received treatment which was inadequate by present standards—which have been achieved only by trial and error—the results were promising (table I). All the serological procedures

TABLE I—RESULTS

Women treated		100
Women giving birth to Rh-negative babies		15
Test sample		85
(1) Number with no history of previous erythroblastotic child		29
(2) Number with history of one or more erythroblastotic children and/or transfusions		56
Result in subsample (1):	Normal babies	27
	Babies died after birth	2
Result in subsample (2):	Normal babies *	20
	Normal after simple transfusion	6
	Normal, 1 exchange transfusion	2
	Slightly retarded (1 not transfused, 1 with simple transfusion)	2
	Died after birth	8
	Stillborn	18

* All infants not receiving blood-transfusions yet developing normally.

N.B.—Those babies transfused were delivered at hospitals other than the Western Pennsylvania Hospital.

were done in the laboratory for research immunology at the Western Pennsylvania Hospital, and the presence of maternal Rh antibody was confirmed in each case by Dr. Bruce Chown of Winnipeg.

Inasmuch as it is common experience among investigators in the field to observe cases of normal Rh-positive children born to sensitised Rh-negative mothers who had not previously had babies with erythroblastosis, I am not emphasising the results in subsample 1. However, it seems unlikely that results such as these would occur in 29 consecutive cases without treatment. Subsample 2 has been studied in detail, and a complete chronicle can be obtained from me. The cases included in this study are those in the Pittsburgh area—treated sensitised women delivered in hospitals near enough for observation of the progress of the infants. These women came to the Western Pennsylvania Hospital for treatment. Of the 56 cases in subsample 2, 46 were referred by outside physicians because of previous difficulties due to Rh sensitisation. Since a few women came in for one or two injections and then abandoned the project, only those are included who received at least 800 mg. of red-cell fraction during a pregnancy. However, every case in the Pittsburgh area in which 800 mg. or more was injected is considered consecutively. Each live-born baby in the treated series was observed by me. Extensive study was made of hospital records to obtain all the facts available concerning each pregnancy in each case before the one in which the mother was treated.

The red-cell fraction is used primarily for the treatment of the Rh-negative sensitised women rather than for the infants after they are born. Each prospective mother is under the care of her own physician and has been referred by him for injections of the red-cell fraction at his request. The current regimen requires a patient who has lost one or more infants because of erythroblastosis to begin treatment not later than the third month of pregnancy, and preferably just after the first missed period. In some cases treatment is begun before pregnancy is established. The already pregnant patient is admitted to hospital and given 400 mg. of red-cell fraction four-hourly day and night until 18 injections have been given. She is then discharged with a supply of red-cell fraction, 200 mg. per ampoule, and her husband is instructed to inject the contents of one ampoule daily. This is continued until term, with the patient reporting every week or every two weeks for antibody titrations and a new supply of ampoules.

The contents of one ampoule (200 mg. in alcoholic solution) are suspended in 6 ml. of sterile physiological saline solution, and the whole is injected *slowly* into the gluteal muscles from a 10-ml. syringe and a 20-gauge 2-inch needle. No reactions have been observed except occasional local soreness. The regimen outlined above leads to the administration of a greater volume of the red-cell fraction than was given to most of the women in table I. There is a tendency with experience to use larger dosages of the red-cell fraction and to attempt to keep the patient saturated.

Discussion

The mode of action of red-cell fraction in the body is not clear. The obvious explanation is that the material is a hapten, and that it neutralises maternal antibodies to Rh. However, the substance seems to exert a directly protective effect on red cells of the infant. In this laboratory maternal antibody titres have shown a consistent falling off under treatment with the red-cell fraction. Goldsmith (1950) has reported similar observations. Some workers have not observed this, but perhaps the smaller volume of total injections explains why they have not done so. The importance of beginning injections of the red-cell fraction very early may be explained by the postulate that, if this substance is hapten, it is of value to use it at least as soon as there are formed elements in the fœtal circulation. According to Patten (1946) the fœtal heart-beat is established by the end of the third week after fertilisation.

TABLE II—RELATION OF OUTCOME TO MATERNAL HISTORY AND REFERRAL

Outcome	Not referred		Referred
	No previous affected infant	Previous affected infant	
No clinical disease ..	19	4	13
Recovered	8	1	12
Died, no kernicterus ..	2	1	7
Kernicterus	0	0	0
Stillborn	0	4	14
Totals	29	10	46

It is difficult to elucidate the real significance of any method of treatment of erythroblastosis, because studies in the natural history of the disease are almost non-existent. Several papers have been published which have given results of pregnancies in Rh-negative sensitised women, but none of these constitute presentations of natural history, because in every case attempts were made to alleviate the disease. Allott and Holman (1949) reported a study of 117 infants with a total mortality of 56%—a mortality of 48% for infants from mothers sensitised only in the current pregnancy, and a mortality of 71% for infants from mothers who have had previous erythroblastotic babies. A comparable breakdown for the present series gives a total mortality of 33%—a mortality of 7% for babies whose mothers became sensitised to Rh with the current pregnancy, and a mortality of 47% for infants whose mothers had erythroblastotic babies previously.

Chown (1952) suggests that the results of treatment should be categorised by assessing whether a current treated pregnancy showed an improved outcome over a previous one or provided a less promising result. Such an analysis of the 56 cases in subsample 2 (table I), after the omission of 14 which, although presumptive, did not provide histories adequate to prove erythroblastosis unequivocably, gives the following picture: improved outcome, 18 cases; poorer outcome, 8 cases; change in results negligible, 16 cases.

The studies of Vaughan et al. (1950), at Harvard Medical School, have provided information as to the relation of outcome to maternal history. A comparison of their series with the present one is of value only if variables are taken into account. The period of their reported investigation includes many cases in which labour was induced before term, a practice which Vaughan et al. feel may conduce to the incidence of kernicterus. With rare exceptions the infants reported in our series were allowed to go to term. In the Harvard series, with exchange transfusion the method of treatment, there were 26% stillborn to 21% in our series, and 54% surviving babies to 67% in our series. The outstanding difference in the two series may be found in those infants with no clinical disease: 18% in the Harvard series and 42% in ours. This difference in the number of normal infants is the only one which can be concluded to have high statistical significance (t of 3·9 at the 0·01 level).

Table II is modelled on table IV of Vaughan et al. (1950). "Referred" means any woman who had her previous erythroblastotic baby in another hospital; "not referred" means one who had her previous erythroblastotic baby in the Western Pennsylvania Hospital.

The category "no clinical disease" in table II is not identical with "normal babies" in table I. "No clinical disease" means entirely free from clinical evidence of

erythroblastosis, whereas "normal babies" include all babies not transfused yet developing normally, of whom a few had very mild clinical disease, such as would be overlooked in the average practice.

Summary

The results of injecting red-cell fraction into Rh-negative sensitised women during their pregnancies are presented in detail as regards the 85 Rh-positive infants.

The method of administration and the possible action in the body of the red-cell fraction are discussed.

The results are analysed, and the conclusion is drawn that treatment of the mother with the red-cell fraction increases the number of normal babies.

I am indebted to Dr. Bruce Chown, of the Children's Hospital, Winnipeg, Canada, for his kindness in checking parent and infant phenotypes and maternal antibody titres and for suggestions and interest. I am grateful also to Mr. Daniel F. Jackson, now with the New York State University College of Forestry, for his statistical analyses of the data. Mr. Vincent Yakulis did much of the laboratory work and Mr. Daniel F. Jackson, Mrs. Elizabeth Lewis, and Mrs. Betty deWeeger assisted with "record-room" research.

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URINARY EXCRETION OF POLYVIDONE

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A SOLUTION of polyvidone (polyvinylpyrrolidone) was first used as a substitute for plasma by Hecht and Weese (1943). We used a 3·5% solution whose detailed composition has been described by Thrower and Campbell (1951); its viscosity, colloidal osmotic pressure, and tonicity are about the same as those of normal human blood.

In a clinical trial of this solution one of us (A. W. W.) infused 500–4000 ml. into each of 75 patients whose blood volume was judged on clinical grounds to be reduced (table I). 23 of the patients died of the effects of their disease or injuries. At necropsy of 20 of these no macroscopical or microscopical evidence was obtained of accumulation of polyvidone in liver, spleen, kidneys, lung, or lymph-glands, but in the absence of a specific stain for polyvidone this evidence is inconclusive. No evidence of toxicity was obtained.

Polyvidone is not metabolised in the body (Ravin et al. 1952), and it is important to know what happens to it after it has been infused. In these patients the direct measurement of changes in plasma volume was impracticable, and measurements of the plasma-polyvidone levels were unsatisfactory; hence the rate of loss of polyvidone from the circulation could not be ascertained. It was possible, however, to measure the quantity of polyvidone excreted in the urine, and from these observations some conclusions have been drawn about the possible distribution of polyvidone in the body.

TABLE I—MATERIAL INVESTIGATED

Condition	No. of patients	No. of deaths
Shock due to severe accidental injury operation, or blood-loss:		
Severe accidental injury	6	3
Severe blood-loss associated with surgical operation	11 } 53	4 } 8
Shock due to surgical operation	36	1
Reduction in blood volume associated with peritonitis, intestinal obstruction, or paralytic ileus:		
Peritonitis	14 } 22	11 } 13
Intestinal obstruction or paralytic ileus	8	2
Total	75	21

Methods

After operation in 20 cases the urinary content of polyvidone was measured by the method of Thrower and Campbell (1951) with a Spekker absorptiometer with Ilford blue-green spectrum filter; readings were taken a minute after the addition of the iodine reagent. The analyses were usually continued until only traces of polyvidone could be found. The duration of the collections varied from 45 to 260 hours after the start of the polyvidone infusion and exceeded 72 hours in 13 cases and 100 hours in 11 cases. These 20 cases have been considered first according to the total quantity of polyvidone excreted, and secondly according to the rate of excretion (table II).

TOTAL QUANTITY OF POLYVIDONE EXCRETED

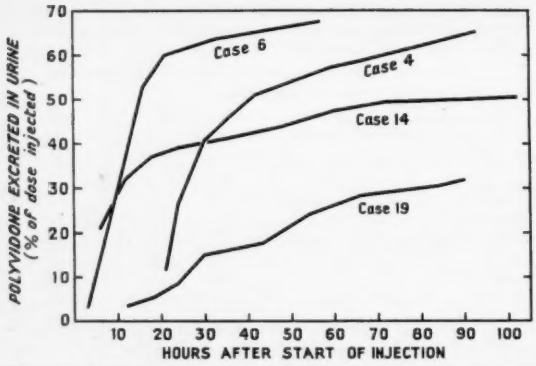
Polyvidone equivalent to more than 70% of the quantity injected was recovered in the urine of 5 patients; in 9 others the equivalent of 50–70%, and in 5 patients of 40–50%, of the dose was recovered; in 1 case less than 30% was recovered after each of two infusions. The largest quantity recovered was 78% of the dose within 72 hours after an emergency gastrectomy (Polya) for a perforated duodenal ulcer in a patient to whom 500 ml. of 'Plasmosan' (17·5 g. of polyvidone) had been administered. There did not appear to be any relationship between the quantity of polyvidone administered and quantity excreted in the urine; the smallest recovery (27%) followed the largest dose (1500 ml. of plasmosan containing 52·5 g. of polyvidone). Another patient (case 12), who received two separate infusions, excreted 51% of the total dose; after the first infusion only 33% of the dose was excreted, but after the second infusion the equivalent of 86% of the second dose was excreted; this suggests that some polyvidone from the first infusion was retained until after the second infusion had been administered.

RATE OF EXCRETION

When the urinary excretions of polyvidone were plotted against time, it was evident that the patients fell into four groups, typical examples of which are shown in the accompanying figure:

(1) In the first group (exemplified by case 6 in the figure) there were 5 patients who each excreted more than 50% of the dose (and 3 more than 60%) within 24 hours of the infusion; the rate of excretion then fell off, but 2 had excreted more than 70% in 72 hours, and 1 other more than 70% in 90 hours.

(2) The main group of 13 patients, most of whom excreted 30–50% in 24 hours, can be divided into two parts: (*a*) 3 patients in whom excretion began as rapidly as in the first group, 2 excreting more than 30% of the dose within 12 hours (exemplified by case 14 in the figure), but the rate of excretion fell off between 12 and 24 hours; and (*b*) the remaining 10 patients, whose excretion began slowly and then increased rapidly with the result that, despite the initial delay, in 5 of these patients more than 40% was excreted within 36 hours (exemplified by case 4 in the figure).



Patterns of urinary excretion of polyvidone in four patients representing four different types of excretion.

(3) The last group, of 2 patients who excreted less than 10% in 24 hours and only 30% in 80 hours (exemplified by case 19 in the figure).

The most rapid early excretion was of 7 g. of polyvidone, equivalent to 21% of the dose within 6 hours, but this patient excreted only 39% in 24 hours and 50% in 102 hours. Small quantities of polyvidone were recovered from the urine within 3 hours of the start of an infusion of plasmosan. When excretion was at its height, the urinary concentration of polyvidone was usually 1–2%, but higher concentrations up to 5% were also found.

There seems to be some relationship between the total quantity of polyvidone excreted in the first 24 hours and the rate of formation of urine. Of the 7 patients who excreted more than 60% of the dose of polyvidone 5 excreted more than 55% of the dose in the first 24 hours and during this period excreted more than 800 ml. of urine. Of the remaining 2 patients 1 excreted 27% of the dose in the smallest 24-hour volume of urine (405 ml.) and the other excreted 47% of the dose in the largest volume of urine (1375 ml.) of this group. In the remaining 13 patients the lower outputs of polyvidone during the first 24 hours were usually associated with smaller 24-hour volumes of urine. When the output of polyvidone had been small during the first 24 hours, diuresis in the second 24-hour period was often accompanied by the excretion of a large quantity of polyvidone.

Discussion

The rate of urinary excretion of polydisperse macromolecules, such as polyvidone and dextran, has been shown in uninjured animals to be inversely proportional to their molecular weight (Grotte et al. 1951, Steele et al. 1952). When the excretion of polyvidone was plotted against time, it was found in 18 out of our 20 cases that the shape of the curve was similar to that which Thrower and Campbell (1951) had suggested was typical for polyvidone. These curves closely resemble that for the excretion of inulin which Schwartz et al. (1949) stated was characteristic of the excretion of a non-metabolisable substance of large molecular weight. Ravin et al. (1952), who injected polyvidone labelled with I^{131} or C^{14} into dogs, rats, rabbits, and man, concluded that polyvidone was not metabolised, and that excretion by routes other than the urine was insignificant. Although the shape of the curves was typical, there was considerable variation in the total quantity of polyvidone excreted and in the time at which rapid excretion began. There was a delay in the onset of excretion of polyvidone of 12 to 24 hours or more in 9 of 20 people, the most likely cause of which seemed to be postoperative oliguria. Ravin et al. (1952) found that the total quantity of polyvidone excreted was independent of the rate of formation of urine when this exceeded 800–1000 ml. per 24 hours; this rate was achieved during the first 24–48 hours in only 8 of our 20 patients.

Detailed characterisation of the distribution of molecular weights in the polyvidone preparation used in these experiments was not available to us. It seems likely, however, that, if the equivalent of more than 60% of the polyvidone in a standard preparation was excreted within 24 hours of infusion by 3 people, this preparation contained a high proportion of material of low molecular weight. This conclusion is supported by the recovery of 70–80% in 4 cases. Ravin et al. (1952) concluded that, for polyvidone, molecules having a molecular weight of 40,000 were the largest that could be excreted in the urine. Since polyvidone is not metabolised in the body, this would imply that nearly 80% of the polyvidone in this preparation had a molecular weight of less than 40,000. Although osmotic effect is inversely proportional to size, increase in plasma volume depends on the retention of the active agent within the blood-vessels. Other capillaries as well as those of the renal glomeruli are permeable to polyvidone of a molecular weight of less than 40,000; hence within a short time after the infusion

TABLE II—URINARY EXCRETION OF POLYVIDONE

Case no.	Age (yr.)	Sex	Diagnosis and treatment	Volume of plasmosan injected (ml.)	Dose of polyvidone (g.)	Percentage of total dose of polyvidone excreted in urine			Duration of estimation of urinary polyvidone (hr.)
						In 24 hr.	In 48 hr.	Total	
1	37	M	Perforated duodenal ulcer; emergency partial gastrectomy	500	17·5	64·7	73·2	78·0	72
2	31	M	Perforated duodenal ulcer; emergency partial gastrectomy	500	17·5	56·1	64·7	77·2	135
3	54	M	Carcinoma at pelvirectal junction; excision and primary anastomosis	1000	35·0	60·3	63·0	76·9	192
4	42	M	Carcinoma of stomach; partial gastrectomy	1000	35·0	26·7	53·3	72·08	260
5	49	M	Chronic duodenal ulcer; partial gastrectomy	1000	35·0	55·8	63·7	68·3	140
6	49	M	Gangrenous appendicitis; pelvic peritonitis	500	17·5	61·0	66·2	67·4	57
7	50	M	Chronic duodenal ulcer; partial gastrectomy	1000	35·0	47·1	57·1	64·0	108
8	26	M	Perforated duodenal ulcer; emergency partial gastrectomy	500	17·5	26·7	59·6	59·6	48
9	24	M	Perforated duodenal ulcer; emergency partial gastrectomy	1000	35·0	37·7	53·3	58·5	72
10	55	M	Inoperable carcinoma of stomach; laparotomy	1000	35·0	43·1	51·2	55·6	96
11		M	Carcinoma of pancreas; partial duodenopancreatectomy ..	1000	35·0	11·4	40·2	53·2	132
12	55	M	Carcinoma of stomach; total gastrectomy	(1) 1000	35·0	13·4	15·8	33·5	110
				(2) 500	17·5	21·0	44·2	85·9	154
13	41	M	Volvulus of cæcum and ascending colon; reduction ..	500	17·5	..	..	50·4	157
14	52	M	Duodenal ulcer, hæmatemesis; emergency partial gastrectomy	1000	35·0	39·0	43·5	50·0	102
15	48	M	Carcinoma of stomach; partial gastrectomy	1000	35·0	..	48·0	49·4	72
16	66	F	Carcinoma of rectum; abdominoperineal excision	500	17·5	30·3	38·7	48·5	168
17	40	M	Chronic duodenal ulcer; partial gastrectomy	1000	35·0	34·3	44·5	46·3	96
18	51	M	Chronic duodenal ulcer; partial gastrectomy	500	17·5	3·27	41·95	45·4	66
19	37	M	Chronic duodenal ulcer; partial gastrectomy	500	17·5	8·84	20·0	42·4	120
20	62	F	Carcinoma of ascending colon; right hemicolectomy; ileus	(1) 1500	52·5	14·1	26·8	27·4	26
				(2) 1500	52·5		28·2		58

a large proportion of these smaller molecules will be distributed in the interstitial fluid rather than in the plasma. As the level of small polyvidone molecules in the plasma is lowered by their excretion in the urine, other small polyvidone molecules probably pass back from the interstitial fluid into the plasma and are then in their turn available for excretion. Possibly variation in this type of equilibration may explain some of the differences observed in the urinary excretion of polyvidone. A preparation with such a high potential wastage in the urine is unlikely to produce consistently large and lasting increases in plasma volume.

Summary

The urinary excretion of polyvidone after the infusion of a 3·5% solution of polyvidone (plasmosan) was measured in 20 patients.

The total urinary excretion of polyvidone was equivalent to more than 70% of the dose in 5 patients, 50–70% in 9, 40–50% in 5, and less than 30% in 1 patient.

Within 24 hours of the infusion the equivalent of more than 55% of the dose was excreted by 5 patients, 30–50% by 13, and less than 10% by 2 patients.

Possible explanations of these variations are discussed.

Messrs. May & Baker Ltd. supplied the plasmosan.

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HYPERTENSION AND "VENOUS" LEG ULCERS

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IN a series of patients with either post-thrombotic or varicose ulceration of the leg the arterial blood-pressure was determined (Anning 1949, 1952). The men formed a group too small for conclusions to be drawn from their blood-pressure readings, but after division into age-groups the blood-pressure records of the women were compared with the figures presented by Robinson and Brucer (1939) based on 3405 American women taken at random. The proportion of ulcer patients with hypertension was found to be significantly higher than in Robinson and Brucer's controls. The criteria of hypertension used by these workers have been criticised by Hamilton et al. (1954), who publish tables showing the mean casual arterial blood-pressure of a sample of the general population, thus making it possible to determine whether the average arterial blood-pressure of leg-ulcer patients is within the normal range or not. The results of such a comparison are presented here.

Investigation

In this investigation the casual arterial blood-pressure of 696 women and 316 men with either post-thrombotic or varicose leg ulcers was determined with a mercury Riva-Rocci sphygmomanometer. The precautions and methods of Hamilton et al. (1954) were used, though only about 85% of the observations were made by me, the remainder being made by several house-physicians. In about 0·5% the blood-pressure was determined when the patient was in bed in hospital. All the patients were weighed. The series includes the patients considered in previous papers (Anning 1949, 1952) together with others examined since.

Tables I and II show the results obtained compared with those of Hamilton et al. (1954). It will be noted that there is a significant difference—i.e., more than twice the standard error of the difference between the means—between the systolic and diastolic pressures of women aged 35–74 and the diastolic pressures of men aged 40–54. There is also a significant difference between the systolic pressures of men aged 40–44 and men aged 50–54. In these various groups it is shown that the ulcer patients have a higher arterial blood-pressure than the sample of the general population. Groups containing fewer than 20 patients have not been compared.

Discussion

The sample of the population investigated by Hamilton et al. (1954) included 421 women and 276 men with varicose veins out of a total of 1204 women and 827 men. These workers found that women with varicose veins showed a significantly more rapid rise of systolic pressure with age. This is of importance in relation to the ulcer patients, many of whom had varicose veins. In addition it would "weight" the control group, tending to lessen the difference between the groups.

In the higher age-groups the difference between the groups tends to become less or to be reversed. This is, no doubt, partly because of the small numbers compared; but there is a probability that hypertensive patients will die before reaching a great age, and this will tend to reduce or obviate the difference between the groups as the age-groups become older.

The cause of the relationship between hypertension and ulceration from defective venous circulation is obscure and has been discussed elsewhere (Anning 1952). Hypertension with varicose veins or the predisposition to venous thrombosis might possibly develop in the same families, but this seems unlikely. In the present series there is no evidence that body-weight is a factor. The opening up of arteriovenous shunts after deep venous

TABLE I—ARTERIAL PRESSURES OF 696 WOMEN WITH LEG ULCERS COMPARED WITH CONTROLS

Age (yr.)	No. of women	Arterial blood-pressure (mm. Hg)							
		Systolic				Diastolic			
		Mean	Standard deviation	Difference of means	Standard error difference of means	Mean	Standard deviation	Difference of means	Standard error difference of means
20–24	(*a*) 2	122·5	..			82·5	..		
	(*b*) 68	118·7	12·7	3·8	..	72·1	7·1	10·4	..
25–29	(*a*) 7	120·7	8·82			74·3	7·61		
	(*b*) 103	122·7	12·6	−2·0		76·1	9·1	−1·8	..
30–34	(*a*) 20	126·5	13·56			83·2	7·95		
	(*b*) 108	120·5	14·8	6·0	3·34	74·5	8·9	8·7*	1·97
35–39	(*a*) 42	136·8	18·28			87·0	12·19		
	(*b*) 119	127·5	16·9	9·3*	3·27	79·3	11·5	7·7*	2·15
40–44	(*a*) 58	141·9	23·27			87·7	14·08		
	(*b*) 122	133·9	19·7	8·0*	3·69	82·1	12·4	5·6*	2·16
45–49	(*a*) 77	153·3	27·64			91·6	13·93		
	(*b*) 114	133·8	22·9	19·5*	3·80	82·1	11·6	9·5*	1·92
50–54	(*a*) 114	163·0	28·65			93·3	14·29		
	(*b*) 131	146·6	27·5	16·4*	3·59	87·8	14·7	5·5*	1·85
55–59	(*a*) 100	167·2	31·54			95·6	15·23		
	(*b*) 108	153·5	28·7	13·7*	4·19	88·6	14·8	7·0*	1·97
60–64	(*a*) 102	176·9	32·81			101·8	7·63		
	(*b*) 87	159·1	27·4	17·8*	4·38	92·4	15·4	9·4*	1·81
65–69	(*a*) 72	182·9	32·68			102·2	15·32		
	(*b*) 74	172·9	26·7	10·0*	4·83	94·0	15·3	8·2*	2·52
70–74	(*a*) 64	193·6	37·69			104·0	18·81		
	(*b*) 60	175·3	27·6	18·3*	5·80	93·1	14·5	10·9*	3·00
75–79	(*a*) 25	176·4	21·51			95·6	9·93		
	(*b*) 26	177·1	32·6	−0·7	7·60	97·3	18·1	−1·7	4·06
80–84	(*a*) 12	185·4	32·14			98·7	16·64		
	(*b*) 11	198·0	31·1	−12·6		96·8	18·5	1·9	
85–89	(*a*) 0	..	..			..	..		
90–94	(*a*) 1	190·0				110·0			

(*a*) Present series. (*b*) Controls of Hamilton et al. (1954).
* A significant difference of means.

thrombosis (Brewer 1950, 1951) and their importance in the ætiology of varicose veins (Piulachs and Vidal-Barraquer 1953) may prove to be of significance in relation to hypertension in these patients. The question whether such shunts lead to a rise in arterial pressure cannot be answered at present. In osteitis deformans arterial degeneration, sometimes with hypertension, is found in most patients aged more than 50 (Hunter 1946). This is a condition in which arteriovenous shunts tend to occur in affected bones, but there is no evidence that they are related to the rise in arterial pressure. Perhaps hypertension is a coincidental finding which, in patients with a defective venous return from the lower limbs, predisposes to ulceration.

TABLE II—ARTERIAL PRESSURES OF 316 MEN WITH LEG ULCERS COMPARED WITH CONTROLS

Age (yr.)	No. of men	Arterial blood-pressure (mm. Hg)							
		Systolic				Diastolic			
		Mean	Standard deviation	Difference of means	Standard error difference of means	Mean	Standard deviation	Difference of means	Standard error difference of means
20–24	(*a*) 6	128·3	11·43			80·8	6·10		
	(*b*) 60	123·0	12·7	5·3		73·8		7·0	
25–29	(*a*) 12	132·9	17·52			86·2	9·83		
	(*b*) 82	124·1	14·0	8·8		74·1	9·9	12·1	
30–34	(*a*) 17	131·2	10·63			85·0	8·57		
	(*b*) 90	122·8	13·9	8·4		73·9	9·7	11·1	
35–39	(*a*) 46	126·2	15·31			82·1	12·50		
	(*b*) 90	125·2	14·1	1·0	2·83	77·8	8·9	4·3	2·16
40–44	(*a*) 40	137·2	15·44			86·2	14·17		
	(*b*) 99	127·4	17·7	9·8*	3·02	77·0	12·9	9·2*	2·58
45–49	(*a*) 42	134·7	20·70			85·6	10·32		
	(*b*) 79	130·9	18·3	3·8	3·79	80·0	10·5	5·6*	1·97
50–54	(*a*) 35	149·0	23·15			90·1	19·04		
	(*b*) 87	134·5	19·8	14·5*	4·44	82·2	11·6	7·9*	3·34
55–59	(*a*) 32	140·6	30·90			88·1	14·34		
	(*b*) 60	145·5	24·4	−4·9	5·45	87·2	13·7	0·9	3·09
60–64	(*a*) 36	161·1	28·32			92·6	17·14		
	(*b*) 52	154·2	33·1	6·9	6·57	87·9	18·7	4·7	3·85
65–69	(*a*) 20	159·0	33·75			89·7	12·61		
	(*b*) 46	152·1	25·9	6·9	8·45	85·2	15·1	4·5	3·59
70–74	(*a*) 14	152·1	35·87			85·3	15·25		
	(*b*) 27	161·4	34·3	−9·3		86·9	18·0	−1·6	
75–79	(*a*) 17	168·2	21·81			90·8	12·86		
	(*b*) 4	150·0	37·7	18·2		82·5	20·2	8·3	
80–84	(*a*) 5	172·0	19·64			87·0	5·09		
	(*b*) 5	174·5	22·8	−2·5		91·0	9·0	−4·0	

(*a*) Present series. (*b*) Controls of Hamilton et al. (1954).
* A significant difference of means.

Summary

The casual arterial blood-pressure of 696 women and 316 men with either post-thrombotic or varicose ulceration of the limbs was compared with that of a sample of the general population determined by Hamilton et al. (1954).

The systolic and diastolic pressures of women, aged 35–74, with ulcers are significantly higher than those of controls. Of the men with ulcers those in some age-groups also had higher pressures.

The possible causes for these findings are discussed.

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IDIOPATHIC HYPERCALCÆMIA OF INFANTS

LOW-CALCIUM TREATMENT

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IN idiopathic hypercalcæmia of infants (Lightwood 1952, Payne 1952) many of the symptoms (e.g., anorexia, constipation, and loss of muscle tone) may be the result of the hypercalcæmia itself. The cause of the hypercalcæmia is not yet established, but possible factors are impairment of renal excretion of calcium and excessive absorption of calcium from the gut. The latter might well occur in infants fed on cow's milk (which contains four times as much calcium as does human milk), patent cereals (many of which are fortified with calcium), and vitamin-D supplements. Whatever the cause, it seemed to us likely that a low-calcium diet would relieve the condition, and we therefore decided to try such a treatment.

Methods

It is not simple to make up an artificial low-calcium milk, because nearly all commercial casein contains calcium caseinate. Our first method, therefore, was to pass milk through a column of cation-exchange resin in such a way that most of the calcium was removed in exchange for potassium, sodium, and magnesium in about normal proportions. Black and Milne (1952) used the same principle to prepare a low-potassium diet. Our second method was to make up an artificial milk with a special low-calcium casein.

The apparatus used for the first method is shown in fig. 1. The main glass tube is about 24 in. long with an internal diameter of 1 in. It contains at least 100 g. of 'Amberlite' resin no. IR 120 H, making a column about 10 in. high. The outflow tube is flexible and usually raised so that the level of fluid cannot fall below the top of the column; this prevents air from getting into the column and lowering its efficiency. When desired, the tube can be lowered and the fluid in the resin column drained off.

The column of resin rests on a perforated porcelain filter disc covered with a thin layer of cotton-wool to prevent small particles of resin from getting through the perforations. This base is set in position with the tube already partly full of water so that no air will be trapped in or under it. The resin is next washed into the tube with plenty of water, the excess of which drains away through the outlet. When the resin has sedimented, the top of the column is covered with another thin layer of cotton-wool to prevent the upper layers from being disturbed by inflowing solutions, and the fluid level is adjusted to the top of the column. Fluid is run into the tube from a separating funnel, whose neck is stoppered with a bung bored to take an air-inlet tube, which reaches to the bottom of the chamber. The air which is drawn in bubbles up through the contents of the funnel and helps to prevent the cream from separating from the milk.

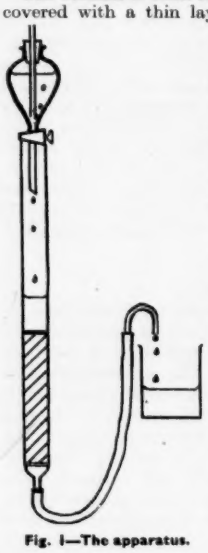

Fig. 1—The apparatus.

The resin is conditioned by running through it 500 ml. of a solution containing potassium, sodium, and magnesium at about forty times the concentrations found in cow's milk

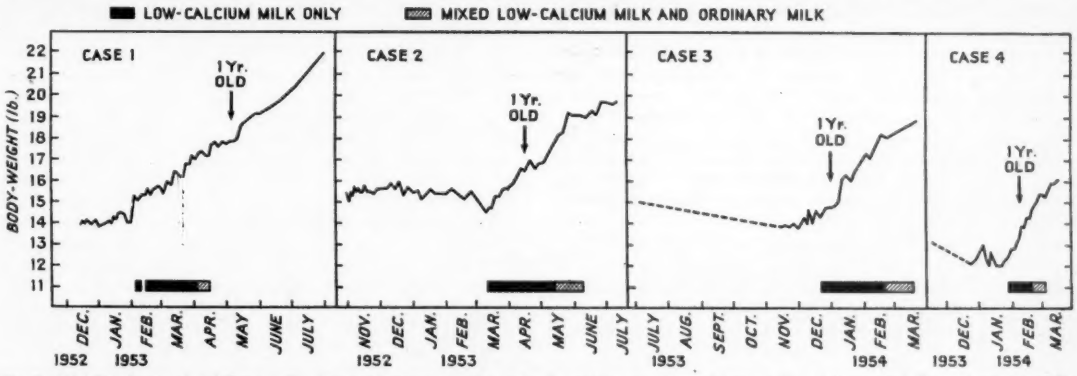

Fig. 2—Weight charts of 4 infants with hypercalcæmia, showing gain in weight on low-calcium milk. Interrupted lines denote weights before admission to hospital.

(0·8 *M* sodium chloride, 1·6 *M* potassium chloride, and 2·4 *M* magnesium sulphate) at a rate of about 150 drops a minute. The fluid level is adjusted to the top of the column. The column is next washed through with 500 ml. of a 1/40 dilution of the above-mentioned solution—i.e., equal to normal milk concentrations—at the same rate, and the fluid level is again adjusted to the top of the column. The resin is now charged with potassium, sodium, and magnesium in the correct proportions and is free from calcium.

When required, a pint of fresh milk can be run through the column at 150 drops a minute. The effluent is clear at first but gradually becomes milky. A volume equal to that initially present in the apparatus (about 80 ml.) is rejected, and all the subsequent effluent is collected. When the outflow has nearly ceased, the outlet tube is lowered, and the milk remaining in the apparatus is run off as completely as possible. The milk is immediately bottled as separate feeds and may be sterilised in the usual way.

After use the apparatus is emptied and the resin repeatedly washed in water, the resin being allowed to sediment, and the supernatant fluid being decanted until it is perfectly clear. The apparatus is thoroughly cleaned with soap and hot water and well rinsed. It is then reassembled and the column prepared as described.

Analysis of samples of milk treated in this way gave the following approximate cation concentrations compared with untreated cow's milk:

	Untreated	*Treated*
Calcium (m.eq. per litre)	60	1–5
Potassium ,, ,, ...	35	70
Sodium ,, ,, ...	20	40
Magnesium ,, ,, ...	10	15

Another form of low-calcium milk has been made up from Allen & Hanburys' "low-ash casein," which contains only traces of calcium. This protein is highly acid, and is first treated with alkali (about 60 ml. of *N* NaOH per 100 g.) to adjust the pH to the iso-electric point of casein (4·7). At this pH the protein is almost insoluble and is washed once with water and twice with acetone, allowing it to sediment, and drawing off the supernatant between washings. It is subsequently dried first in a stream of warm air and finally in a vacuum desiccator over P_2O_5. More recently we have found that even casein which contains large amounts of calcium can be rendered almost calcium-free by dissolving, precipitating at pH 4·7, washing, and drying.

This casein is used to make up an artificial milk approximating to human milk, except that the calcium content is low. To obtain 1 litre of milk, 20 g. of prepared casein is treated with 368 ml. of distilled water + 2·0 ml. of 4 *N* potassium hydroxide + 2·0 ml. of 2·5 *N* sodium hydroxide, mixed well, and stood for $^1/_2$–1 hour at room-temperature with repeated gentle mixing to dissolve. Next the following solutions are added and mixed well: 2·0 ml. of 2·25 *M* dipotassium hydrogen phosphate, 2·0 ml. of 0·5 *M* potassium dihydrogen phosphate, 2·0 ml. of 0·5 *M* sodium sulphate, 2·0 ml. of 1·5 *M* magnesium chloride. This solution will keep for a few days in the refrigerator. On the day of use 500 ml. of water + 70 g. of lactose are added and the mixture is warmed to dissolve, autoclaved at 5 lb. for 10 minutes, and cooled. 60 ml. of this is added slowly, stirring with a sterile glass rod, to 60 ml. of pasteurised cream containing 50% fat. Next the diluted cream is added to the rest of the mixture, which is bottled as individual feeds in sterile containers and put in the refrigerator until wanted. The final composition of such a milk is as follows:

Fat	3% (by calculation)
Lactose	7% ,, ,,
Casein	2% ,, ,,
Calcium	2 m.eq. per litre (by analysis)
Potassium ..	18 ,, ,, ,, ,,
Sodium	9 ,, ,, ,, ,,
Magnesium	6 ,, ,, ,, ,,
Chloride	7 ,, ,, ,, ,,
Phosphate ..	15 mg. per 100 ml. as phosphorus (by analysis)
pH	7·0 (by analysis)

These values are close to those given for human milk—e.g., Hawk et al. (1947)—except for the calcium, which is normally 15 m.eq. per litre.

Results

Both milks were palatable and taken satisfactorily; one child took the artificial human milk more readily when it was flavoured with 'Marmite.' Both milks showed rapid separation of the cream, especially when heated. After autoclaving at 5 lb. for 15 minutes the cream of the resin-treated milk could be resuspended by shaking: this was, however, impossible with the artificial human milk, which was therefore not heated after addition of the cream.

On our régime the child is given a low-calcium diet based on low-calcium milk. For supplementary carbohydrate 'Farola' is used, because this is a plain semolina to which no calcium has been added. Supplementary iron is also given. No extra vitamin D is allowed, but orange juice or ascorbic acid is given as usual, and marmite as a source of the vitamin-B group. When the serum-calcium level has fallen below 6 m.eq. per litre (12 mg. per 100 ml.), the low-calcium milk is progressively replaced by ordinary cow's milk. Sooner or later spontaneous recovery may be expected, and the infant can return to a normal diet. Since our artificial human milk lacks many ingredients of the natural secretion, it may be unwise to use it as the principal item of diet for more than a month; by this time it should be possible to substitute for it, in part at least, cow's milk.

4 infants with idiopathic hypercalcæmia have now been treated. The 1st received resin-treated cow's milk, the 2nd resin-treated human milk, the 3rd artificial human milk followed by resin-treated cow's milk, and the 4th artificial human milk. In every case there were (1) an improvement in the general well-being of the child within a few days, with increased appetite and cessation of vomiting; (2) a rapid gain in weight, whereas previously weight gain had been very slow or had ceased; and (3) a fall in serum-calcium level, reaching normal

levels in 2–6 weeks. Weight charts are given for each child (fig. 2).

These results must be interpreted with caution because spontaneous recovery is usual. Nevertheless they are encouraging enough to justify the further use of a low-calcium diet in the treatment of this condition.

We thank Dr. J. Apley, Dr. B. D. Corner, and Prof. A. V. Neale for permission to publish the results of treatment in case 1, cases 2 and 3, and case 4 respectively; and Mr. H. Donaldson and Mr. L. Haugh, A.I.M.L.T., for their help in making the special milks.

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STERILISATION OF SYRINGES AND NEEDLES

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THE sterilisation of syringes and needles for use in hospital wards, theatres, and special departments has become accepted as an essential service and one that is usually organised and controlled by the pathological laboratory. Various techniques have been described, but all leave something to be desired.

At the Kingston Group Laboratory sterilisation in aluminium containers has made the supply of sterile equipment easy and convenient to small hospitals in the group, to general practitioners, and for the use of laboratory staff on domiciliary visits.

Syringes

The traditional ward method of sterilisation by boiling in water covered every type and size of syringe. For hypodermic injections it still appears an adequate and cheap method and will remain so, unless ready-made plastic injectors or cartridge syringes are developed at a very cheap price. There is very little evidence of accidental infections with boiled-up hypodermic syringes and needles; and, if the laboratory-controlled syringe service is not to become unwieldy and expensive, it is probably best to leave the ordinary ward steriliser to deal with many of the hypodermic syringes. We do provide 2-ml. syringes which are used for hypodermic purposes on many occasions, but the Medical Staff Committee decided that the laboratory should not be asked to provide smaller syringes.

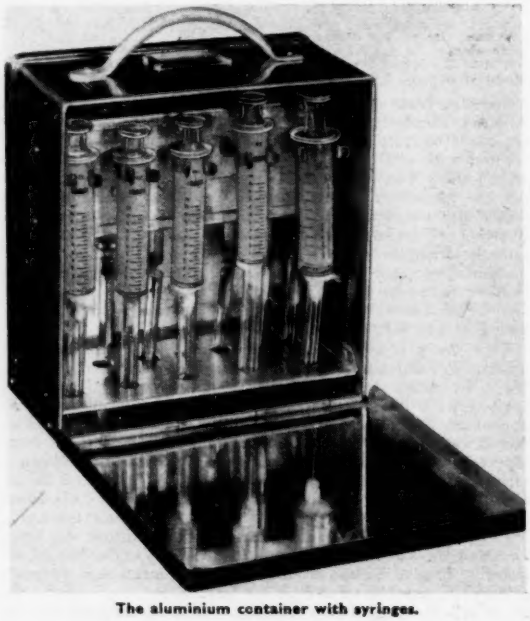
The laboratory undertakes this service for two reasons: (1) the laboratory staff can be expected to understand and guarantee the sterility of the syringes; and (2) the laboratory is interested in obtaining good specimens for test purposes, and it is for taking specimens that most syringes are used. Since water, even in minute quantities, may ruin specimens for many tests, the method of sterilisation must be dry, and the use of ovens and the control of their temperatures falls into line with other laboratory procedures.

In most laboratory syringe services the syringe, usually with needle attached, is placed in a glass tube with a cotton-wool plug at the bottom, the whole being wrapped in either 'Cellophane' or kraft paper. This involves having a stock of different sizes of glass tubes, adding one more easily broken object, at about two shillings a time, to the all too easily broken syringe. It involves the cutting of cellophane into appropriate sizes and the wrapping of each syringe separately. In the ward or in the theatre it calls for the laying out of several syringes which, once removed from their wrapping, are no longer sterile.

An aluminium container (see figure) was therefore devised in which syringes can be stacked in the numbers most likely to be needed, and the needle can be inspected and a syringe selected without interfering with sterility, and which can be safely carried on a ward trolley or in a doctor's car. It takes a moment to fill, stacks easily in the steriliser, and in practice has enormously reduced breakages both of syringes and of other glassware. The present container measures $8^1/_2 \times 8^1/_2 \times 4^1/_2$ in. and has a handle on top and doors which flap down on either side, lying flat on the table. The syringe-holding clips accommodate on one side 5×2 ml. and 2×5 ml. syringes, and on the other 4×10 ml. and 1×20 ml. In my daily outpatient clinic one container is usually enough. Wards are given a stock according to experience. There appears to be no point in making the containers larger, because it is better for a busy ward to have more than one, and that all should be returned at short intervals for servicing.

The syringes clip on in an upright position but are not disturbed by shaking or if the container is laid on its side. The needle is protected by a glass tube measuring $3 \times {}^1/_2$ in. Round the neck of the needle and occluding the glass tube is a small plug of cotton-wool. So long as the wool is there, the needle is sterile; when a syringe is used, the wool is thrown away. After use the syringe is rinsed in cold water and returned to its place, the absence of the cotton-wool indicating that it has been used. The syringes are oiled or coated with silicone. The container is, of course, opened only for as long as is necessary to take out the syringe and closed immediately, and repeated cultures show that no detectable contamination of the interior takes place in ordinary use.

The containers pack very well in the ordinary dry oven and are sterilised by exposure to 160°C for 1 hour. The syringes may be (1) all glass, (2) glass with annealed metal nozzles, of which we use mainly Chance's 'Interchangeable,' or (3) glass with metal ends—e.g., 'Balco'—of which the cement stands up to dry heat. In practice the last-named proves best for ward use, and breakages since the introduction of such syringes in metal containers



The aluminium container with syringes.

have been greatly reduced. All these syringes are Luer fitting. Part of the servicing of the syringe is to test for air leakages, because although modern cements do not run at 160° C they become granular after a time and might not be airtight. They can, of course, be re-cemented. Aluminium containers have not entirely abolished cellophane-wrapped syringes, which may still have a place for certain functions and where only an occasional stand-by syringe is wanted.

In supplying small hospitals and clinics at some distance from a group laboratory these syringe containers appear to be ideal. No attempt has yet been made to calculate whether monetary savings could be made in a group by cutting down on sterilisers or on time spent on sterilising techniques in wards. If made they would be small in relation to the total budget. But in comparison with other syringe-service techniques there is a considerable saving of time, with the result that the output of syringes is greatly increased and the servicing charge per syringe greatly decreased.

Lumbar-puncture Sets

Lumbar puncture is not without its bacteriological hazards, and it is important that the equipment used should be completely sterile. Here again the old technique of boiling the needles and then bringing them to the patient's bed in a container either of water or of spirit was far from perfect. In addition to the lumbar-puncture needle there may also be needed a syringe for injection of a local anæsthetic, a syringe for withdrawal of cerebrospinal fluid, and a manometer. In children's wards the manometer is seldom used, and the needle is usually shorter and finer than for adults.

Accordingly two sets of lumbar-puncture equipment are provided. For the children's ward an aluminium container measuring $8 \times 2 \times 1^1/_4$ in. is lined with lint and packed with a needle protected by a glass tube, a 2-ml. syringe, and a 10-ml. syringe, the latter with 'Record'-size fitting because no lumbar-puncture needle appears to be made with Luer fitting. After sterilisation the aluminium container is sealed with tape. For adults a container measuring $15 \times 2 \times 1^1/_4$ in. is packed with manometer, needle, and a 2-ml. syringe and sealed with tape. Wards carry a stock of these containers according to their experienced need, and the doctor doing a lumbar puncture can be sure that he has a complete set of sterile equipment ready to hand. Many manometers are sealed with a cement which does not stand dry heat, and in such a case the container is autoclaved.

Petri-dish Holders

Having had much difficulty with the copper containers for 4-in. glass culture plates which are traditional in every bacteriology department, we decided to try aluminium. To our surprise no supplier whom we asked knew of any firm making such containers, although spun aluminium for cylindrical containers is familiar to every housewife. Later it appeared that others had already tried this idea, and we are now using such a container. In practice it is superior in every way to the familiar copper box. It is seamless, will wear for years as domestic aluminium ware proves, and is cheaper.

Summary

Aluminium containers for syringes are described which make the provision of a sterile syringe service cheaper and simpler. Other aluminium boxes for lumbar-puncture needles and petri dishes are also described.

The prototypes of these boxes were paid for by a grant from the research fund of the South West Metropolitan Regional Hospital Board. Most of the details were worked out by Mr. G. Phillips, chief technician, in conjunction with Mr. W. M. England, of Messrs. R. B. Turner & Co. Ltd., to whom we are indebted for the illustration.

Reviews of Books

Tuberculosis in Childhood and Adolescence

F. J. BENTLEY, M.D., F.R.C.P., D.P.H., senior physician; S. GRZYBOWSKI, M.D., M.R.C.P., senior registrar, High Wood Hospital for Children, Brentwood, Essex; B. BENJAMIN, B.SC., F.I.A., formerly statistician, London County Council. London: N.A.P.T. 1954. Pp. 259. 30*s*.

IN their detailed account of the course of pulmonary tuberculosis in 1049 children between the ages of 3 and 15 years admitted to the High Wood sanatorium, Essex, during 1942–46, Dr. Bentley and his colleagues have clarified some aspects of the natural history of primary tuberculosis and have considered its epidemiology and incidence. They always have facts to support their views, and their opinions will interest everyone sharing in the care of children with primary pulmonary tuberculosis.

The opening chapter deals with terminology. Then follow chapters on simple primary pulmonary tuberculosis, on segmental lesions, on the influence of age on prognosis, on calcification and secondary infection, and on the management of primary infection. Finally, there are three chapters on chronic (bronchogenic) pulmonary tuberculosis in adolescents and its relation to primary infection. This is in some ways the most important section in the book, because it brings to our attention again one of the most pressing questions in tuberculosis today—that of adolescent phthisis. How often does the chronic disease follow primary infection acquired a short time earlier and incompletely healed, and how much is it due to exogenous reinfection? The importance of this question cannot be exaggerated, for half the children leaving school at 15 years fail to react to tuberculin and most of them are infected within the next few years. The related question—how does bronchogenic tuberculosis arise?—also receives fair treatment.

Tuberculosis is difficult to understand. Few people have the opportunity of seeing the whole picture in a population; the cycle of infection and the possibility of clinical illness spans many years and generations rather than individuals. The authors have tried to overcome the difficulty of dealing with selected material by their "death investigation." But retrospective examination of clinical notes is usually unsatisfactory, and this chapter does not carry the weight of those based on the authors' own data. Even so, it shows that contact clinic work alone, though desirable for other purposes, will not in itself prevent infection or the onset of the serious hæmatogenous or neurological complications.

This authoritative statement of the problem of the primary infection will help to focus attention on the fundamental importance of the primary infection in the natural history of tuberculosis. Production and print are excellent, and the reproduction of the radiographs is far above the usual standard. A book to have and use.

Abilities of Babies

A Study in Mental Measurement. RUTH GRIFFITHS, M.A., PH.D., DIP.ED., F.B.PS.S. London: University of London Press. 1954. Pp. 229. 20*s*.

Dr. Griffiths points out that there are three main directions in which man's development differs from that of the higher animals: he achieves the erect posture; this frees the hands, which he uses in manipulative skills; and he learns to speak and to understand speech. "The arresting fact is that all these three aspects of development . . . are achieved by the average baby within the short span of the first fifteen months of his life. This is an enormous achievement . . . which lays the foundations of all that comes afterwards." Dr. Griffiths set out to observe the development of ability in many children under two years old, and finally to test 571 (mostly in infant-welfare centres) in order to establish a scale of development. This sort of thing has been done before, notably by Gesell; but it is all to the good to have a fresh investigation of a difficult subject, with standards based on Kensington instead of Connecticut. By careful investigations, Dr. Griffiths attempts to provide balanced scales of development in five directions—locomotor, personal-social, hearing and speech, hand-and-eye development, and performance (the ability to reason in practical situations or manipulate materials intelligently).

Without using her methods and comparing them with others it is difficult to know how far she has succeeded; but her care, and her own ability to see a situation whole, make an encouraging impression.

How much will this help a doctor trying to decide whether a baby is mentally defective, deaf, or emotionally deprived? Very little, directly, for most doctors (rightly) leave specific testing to the practised expert—though there is nothing in her tests that a physician whose work lay in this field could not master with ease if he took the trouble. On the other hand, the reports of the tests, which in this book are expressed as histograms of the quotients obtained in the five separate groups, should be very interesting. Thus one can see at a glance that although a deaf child has a G.Q. (general quotient) of 82, speech development is only 48, personal-social 75, and locomotor, hand-and-eye, and performance nearly 100. Graphical representation is as telling here as in reports of sugar-tolerance tests or audiograms. Dr. Griffiths does not, however, "claim any great predictive value for the new procedure," which has been in use for too short a time for the babies' test results to be compared with their performance in later childhood.

Mammalian Germ Cells

A Ciba Foundation Symposium. Editor: G. E. W. WOLSTENHOLME, O.B.E., M.B., assisted by MARGARET P. CAMERON, M.A., and JESSIE S. FREEMAN, M.B. London: J. & A. Churchill. 1953. Pp. 302. 30*s*.

THE twenty-four articles in this symposium provide lucid descriptions, further enhanced by discussions, of pioneer biochemical and endocrinological investigations in the assessment of the fertility of ova and spermatozoa.

The articles are almost equally divided between the two germ-cells and there is a slight preponderance of contributions from this side of the Atlantic. Most of the work is concerned with farm and laboratory animals; only three of the articles deal with human fertility. The fundamental problem is the search for ways of reducing Nature's waste of genetically valuable germ-cells, and the emphasis is on artificial insemination and superovulation. Of particular interest is the possibility of preserving the living germ-cells for long periods at low temperatures.

But all advances have possible drawbacks, and in his foreword Mr. S. J. Folley, D.SC., F.R.S., gives a clear warning: "The technical advances foreshadowed by the researches reported in this volume are primarily envisaged as applicable to stockbreeding. The fact must be faced that they can also be applied to man, and society will have to consider seriously how best to handle these new possibilities which may be fraught with as much significance and danger of misapplication as the discovery of how to release the energy of the atomic nucleus."

Origins of Psycho-Analysis

Letters to Wilhelm Fliess, Drafts and Notes, 1887–1902. SIGMUND FREUD. Editors: MARIE BONAPARTE; ANNA FREUD; ERNST KRIS. Authorised translation by ERIC MOSBACHER and JAMES STRACHEY. London: Imago Publishing Co. 1954. Pp. 486. 30*s*.

IN chapter XIII of his *Life of Freud* Ernest Jones has provided so illuminating an account of Freud's relationship with Wilhelm Fliess that most of the novelty of this remarkable correspondence has been anticipated. There is, however, much that rewards the reader interested in the birth-pangs of a revolutionary theory, and the intellectual and emotional crises of a man of genius. The book contains, moreover, drafts of various essays and notes which are significant for the early history of psycho-analysis, as well as Freud's lengthy and sustained, but unfinished, effort to provide a neurophysiological basis for psychology and to furnish us, as its opening sentence put it, "with a psychology which shall be a natural science; its aim, that is, is to represent psychical processes as quantitatively determined states of specifiable material particles"—namely, the neurones. Though it was doomed to failure at that stage of physiological and psychological knowledge, it was almost inevitable that the project should be attempted by a man of Freud's training and that it should contain, hidden behind anatomical and physiological terms, concepts that he used freely in his subsequent purely psychological writings. The book is supplied with many helpful footnotes, and a concise introduction by Ernst Kris.

Microbiology and Human Progress

MADELEINE PARKER GRANT, PH.D., professor of biology and bacteriology, Sarah Lawrence College. New York: Rinehart. London: Allen & Unwin. 1953. Pp. 718. 48*s*.

"THIS college text was written for introductory courses in bacteriology . . . for students whose major interests may lie outside the field of science." Such eclectic opportunities in education are rare in our universities, and for this reason the idea deserves sympathetic attention. Professor Grant has read widely and her attempt to present the phenomena of microbiology as illustrations of general biological principles is imaginative and interesting. Almost half the book is devoted to the "microbic foes of man" and this is far less satisfactory. The shorter section on "microbic friends" is also disappointing, for such a book as this would have been a proper place to correct the popular view that bacteriology is the province of the doctor alone.

Surgery for Dental Students

MICHAEL F. A. WOODRUFF, M.D., M.S. Melb., F.R.C.S., professor of surgery, University of Otago. Oxford: Blackwell Scientific Publications. 1954. Pp. 307. 30*s*.

THIS useful book, based on a series of lectures given by Professor Woodruff when he was a lecturer in dental surgery at the University of Sheffield, is designed for dental students qualifying in this country, and its contents cover the set syllabus. Each subject is dealt with concisely, clearly, and economically, and the text is well illustrated by photographs. These will be very welcome to dental students, who encounter general surgical conditions all too rarely during their training.

The University of Leeds

The First Half-Century. A. N. SHIMMIN, C.B.E., M.A., professor of social science, University of Leeds. Cambridge: University Press. (For the University of Leeds.) 1954. Pp. 230. 21*s*.

IN this handsome volume Professor Shimmin tells the story of how the university has honoured its motto "And Knowledge shall Increase." In the first part he traces the historical and geographical background to the university's growth and describes its rapid advance during the first fifty years.

The first step was taken in 1831, when the School of Medicine was opened. More than forty years later the Yorkshire College of Science was founded, and in 1887 the two bodies became part of the federal Victoria University, which split into the separate Universities of Manchester, Liverpool, and Leeds in 1903–04. The students are four times as many as in 1904, and it has been hard to keep a balance between science and arts. Professor Shimmin also discusses the problems of student welfare and the relationship of the city with the university, and in the second part of the book he describes the trend of present-day teaching and research in each faculty. Maurice de Sausmarez, the head of the department of fine art, has contributed graceful pen and wash drawings.

Arthur Rendle Short: *Surgeon and Christian* (London: Intervarsity Fellowship. 1954. Pp. 208. 8*s*. 6*d*.).—It is but eight months since Rendle Short died, and this interval does not allow of the effective critical appraisal he deserved. In this biography Mr. W. Melville Capper and Mr. Douglas Johnson, seeking to perpetuate the main message of his life and to throw into relief the principles which inspired it, give a good deal of space to his work for the Christian Brethren of Bristol and the West Country, but there are also interesting sections on his experiences as an undergraduate student, a young doctor, and a surgeon on the staff of a teaching hospital. Here much of the material is autobiographical, including his characteristic description of the day he thought that he had bungled hopelessly his final F.R.C.S. examination. "Filled with gloom and despair I betook myself to a scientific library and got down a copy of the *Quarterly Journal of the Geological Society* containing Vaughan's paper on the Carboniferous. It was immensely comforting."

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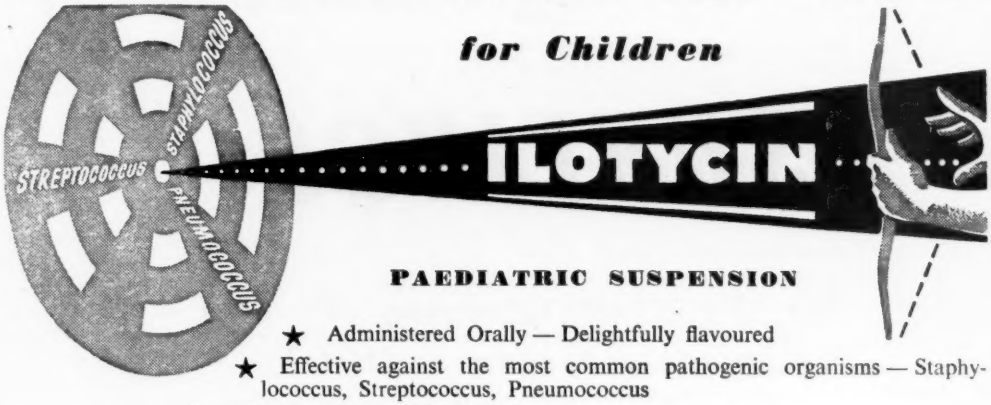

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THE LANCET
LONDON: SATURDAY, JUNE 19, 1954

Beyond Spens

THE Government's decision to find another £3¼ million a year for hospital doctors was surprising. At a time when taxation is too heavy, when wage claims are strongly discouraged, and when hospitals are being asked to cut their expenditure, it cannot have been convenient to add so large a sum to the incomes of a small number of people who, in the eyes of the public, are already well off. The decision was made for two reasons: first, because the Danckwerts award tipped the balance so far in favour of general practice that recruitment of able young doctors to the specialties was endangered; and, secondly, because some members of the Cabinet felt that consultants had not had a fair deal. The unfairness, of course, lies in the fact that, though the Government of the day accepted the reports of both the medical Spens Committees—on the remuneration of general practitioners and on the remuneration of hospital doctors—quite different "betterment factors" have been applied to practitioners and to consultants in translating the Spens 1939 figures into post-war money. Under the Danckwerts award practitioners gained 100% betterment; and though this was not distributed equally among them, and was conditional on a reduction in the size of the larger lists, their allowance for changes in the cost of living became far higher than the betterment factor of about 20% which was given to hospital staffs. Thus nobody could pretend that the financial recommendations of the second Spens Committee had really been fulfilled, and in making amends to the tune of £3¼ million the Government still fall short of fulfilling them. On the other hand, from the time that consultants accepted their contracts in 1949 there has been no legal obligation on the Government to revise the terms of these contracts; and if, as some suggest, hospital consultants are now to say "thank you for nothing" and press implacably for "every penny of Spens," they should remember that moral obligations are seldom as precisely assessable as legal ones. A moral claim—that is to say, a claim to what fair-minded people will think proper—differs from a legal claim in that the field of inquiry is larger.

The first Spens Committee was asked to consider "what ought to be the range of total professional income of a registered medical practitioner in any publicly organised service of general medical practice," and it concluded that before the war too many general practitioners had too low an income. Accordingly it recommended a range of remuneration which it hoped would increase the financial attractions of general medical practice both as against other professions and as against other branches of medicine; and, thanks to the Danckwerts award, this hope has now been fulfilled. The second Spens Committee was asked to consider "what ought to be the range of total professional remuneration of registered medical practitioners engaged in the different branches of consultant and specialist practice in any publicly organised hospital or specialist service." Though it wanted to raise the financial status of men and women in training, it was concerned to maintain, rather than improve, the situation of the specialist or consultant, and its proposals were designed to give him, in relation to other people, a position such as he held before the war. On a general view, it is arguable that this object, too, has been attained [1]—at least for the part-time consultant, whose opportunities for private practice remain greater than was expected. The relatively unsatisfactory position of the whole-time consultant might best be dealt with, not by any general raising of consultant remuneration but by applying the Spens recommendation about expenses to the whole-timer and by allowing him to take fees for domiciliary consultations—a change which is demonstrably desirable for the proper working of the service.[2]

The post-war redistribution of national income in favour of the wage-earner, and the taxation by which it is maintained, have combined with rising prices to hit the salaried middle classes; and few among them can afford the amenities of 1939, at any rate if they are paying for the private education of children. Hence the adequacy of doctors' remuneration cannot be judged simply by whether they feel that they are comfortably off. The ultimate test is whether the main purpose of the Spens proposals has been achieved: do enough recruits of the right type still apply to take up medicine, and do enough doctors of the right type think it worth their while to train for a specialty? Certainly the public will be ill served if doctors cannot maintain a decent standard of life or if they are preoccupied with getting money or making ends meet. They will be even worse served if too many intelligent boys and girls decide that medicine is too unremunerative for them to take up, or if too many intelligent doctors decide that they cannot afford to be anything but general practitioners. In so far as it has reason to believe that any of these things are happening or likely to happen the profession can reasonably urge that scales of payment should be altered. But whatever claims it makes for revision of remuneration in the National Health Service should arise from the requirements of that service at the time of the claim. The public interest is a sounder basis for negotiation than the litigious reiteration of former rights whose present validity is in doubt.

The two medical Spens reports were brilliant and influential documents, and the one on consultants and specialists showed exceptional insight and foresight. It abolished the state of affairs by which many doctors could not afford to train as specialists unless they had private means. It gave the same basic pay to consultants in London teaching hospitals and in the district hospitals of the remotest region, and to those in the oldest and in the newest specialties. It introduced a novel system by which, while age and service had their due, allowance was made for out-

1. Central Consultants and Specialists Committee, Bulletin no. 3; pp. 4 and 7.
2. See *Lancet*, Jan. 23, 1954, p. 210.; Feb. 13, p. 366; Feb. 20, p. 412.

standing merit. At a time of egalitarian revolution, it insisted that the range of remuneration should remain wide. And finally it introduced the principle that experts working in a public service should have the kind of livelihood they could earn outside it—a principle repugnant to many administrators but profoundly important if public services are to be more than second-rate. Nevertheless, though in all this "consultant Spens" justifies its description as a charter, it scarcely qualifies as an infallible work of revelation. In the first place (assuming equal betterment over 1939 money values) it made the remuneration of specialists so superior to that of practitioners that it defeated the intention of the previous Spens Committee, which wanted to make general practice "sufficiently attractive to prevent all the abler men endeavouring to enter specialist practice." Equally serious, however, was its failure to make any distinction between consultants and specialists, and its consequent assumption that all the doctors in a hospital were either consultants or were training to become consultants. As soon as the Ministry of Health began to consider the offer of contracts, it could not but observe that in many departments of medicine—notably in psychiatry, pathology, venereal diseases, and tuberculosis—there are not a few doctors whose continued services are very necessary to the hospital but to whom their colleagues turn as specialists rather than as consultants. To meet this difficulty the Ministry, with the reluctant acquiescence of the profession, made a major departure from the Spens charter and invented the grades of senior hospital medical officer (S.H.M.O.) and junior hospital medical officer, tenable only in certain specialties. Up to now the representatives of the profession have been unwilling to agree to appointments to this grade in the main departments of medicine; for, with good reason, they fear the possibility that administrators, intent on saving money, may see in such lesser appointments a means of economising on consultants. But here again, when it comes to running the hospitals, we come up against hard facts. If, in order to prevent future disappointment, the number of young men allowed to train for consultant posts is henceforward to be strictly related to the number of consultant posts expected to fall vacant, there will no longer be enough trainees in the hospitals to ensure that the necessary medical and surgical work gets done. Much essential work is undertaken by those senior registrars who, because they have not yet secured posts as consultants or S.H.M.O.s, are now described as redundant. The truth is that few if any of these are really redundant; and, if our existing system has no place for them, we shall evidently have to make such alterations in the system as will enable them to go on using their skill to advantage. This is as necessary for the sake of the hospitals as it is for the sake of the registrars themselves, who were encouraged by the Ministry and the profession to train themselves for consultant posts which have not materialised. Their plight has become a standing reproach to us all.

What seems to be needed to restore health to the hospital medical service is that all parties shall agree to go back to the point where the Spens Committee (as we can now see) failed in prescience—the point at which it lumped consultants and specialists together. In our opinion the proper title for a person who has completed his training in a specialty, or has spent some years in specialised activities, is that of specialist, and we see no reason why appointment as a specialist (working under some degree of supervision by a consultant) should not be the route by which consultant rank is normally approached. The transference of S.H.M.O.s to the new grade would not only give them a more suitable title but also rescue them from a backwater where no current flows—a backwater from which very few have been able to regain the main stream. To the registrars who have been miscalled redundant, appointment as specialists would give time to prove their capacity to become consultants, or at the worst it would enable them to continue (as members of a team though not at its head) the kind of work they have chosen. To achieve these ends without jeopardising the position it has to defend, the Joint Consultants Committee will doubtless have to make conditions: it will need power, for example, to control, with the Ministry, the numerical relationship of specialist and consultant posts. But we feel sure that better and more rational arrangements can be made for hospital medical staff—provided consultants are ready to think beyond the Spens report and to follow the spirit rather than the letter of that famous text.

Renin

ALMOST sixty years ago TIGERSTEDT and BERGMAN [1] showed that the injection of a saline extract of fresh rabbit kidney into normal rabbits caused a rise of arterial blood-pressure. They recognised that with repeated injections the pressor effect diminished and eventually ceased—a feature termed tachyphylaxis. Despite a vast amount of investigation the significance of the renal pressor agent, known as renin, in human hypertensive disease is still far from certain. Renin is a protein enzyme obtained from renal cortex which reacts with its substrate, hypertensinogen (a plasma alpha-globulin), to form a substance of smaller molecular weight known as hypertensin. This is probably a polypeptide and is the active pressor agent, renin being inactive in the absence of its substrate. Hypertensin is labile and is rapidly destroyed and inactivated by a plasma enzyme known as hypertensinase. SKEGGS et al.[2] have recently shown that the chemical reactions involved are complex. By a counter-current distribution process they have separated hypertensin into two polypeptide fractions, which they term hypertensin I and II. The former is rapidly converted into the latter by another plasma enzyme. Both are active pressor agents and caused very considerable increases of both systolic and diastolic blood-pressure when injected intravenously in volunteers.

PICKERING and PRINZMETAL [3] showed that the blood-pressure of rabbits starts to increase about thirty seconds after an injection of renin, the highest pressure being reached about two minutes after the injection; the pressor effect usually lasts thirty minutes or longer. Despite the property of tachy-

1. Tigerstedt, R., Bergman, P. G. *Skand. Arch. Physiol.* 1898, **8**, 223.
2. Skeggs, L. T., Marsh, W. H., Kahn, J. R., Shumway, N. P. *J. exp. Med.* 1954, **99**, 275.
3. Pickering, G. W., Prinzmetal, M. *Clin. Sci.* 1938, **3**, 211.

phylaxis, BLACKET et al.[4] have maintained hypertension in rabbits for as long as two weeks by infusing renin. The cardiac output is somewhat reduced after injections of hypertensin in man,[5 6] the pressor effect being entirely due to peripheral vasoconstriction. The glomerular filtration-rate tends to rise and renal blood-flow falls considerably[7]; these differential effects are usually held to indicate constriction of the efferent glomerular arteriole. Such circulatory and renal hæmodynamic findings are similar to those in essential hypertension,[8] but unlike those in acute glomerulonephritis[9] where afferent arteriolar constriction is thought to occur. DANIEL et al.[10] have further investigated the effects of renin on the renal circulation of the rabbit by an angiographic technique. Angiograms taken shortly after the peak of the pressor response showed constriction of the smaller intrarenal arteries and increased renal circulation-time. In half the animals the ischæmia involved chiefly the peripheral cortex; in the rest it was more generalised. Some renal vasoconstriction was still present shortly after the blood-pressure had returned to normal. It seems very unlikely that renin is directly concerned in the ætiology of essential hypertension in man. HAMILTON et al.[11] have found that the condition we speak of as essential hypertension cannot be strictly defined, there being a continuous variation of blood-pressure levels in any group of selected age and sex, with no evidence of any natural division between hypertensive and normotensive people. HAYNES et al.[12] found no significant difference in the content of renin in blood obtained by catheterisation of the renal vein in patients with hypertension of varied origin and in control normotensive patients. A humoral mechanism is perhaps most likely in hypertension secondary to unilateral renal disease—usually chronic pyelonephritis[13 14]—but the part played by renin has not been exactly defined either in this clinical disorder or in experimental hypertension secondary to renal ischæmia. In particular we are completely ignorant of the reason why some cases of chronic pyelonephritis are associated with hypertension while some are not.[15]

Renin has been shown to have a distinct diuretic effect in the rabbit and the rat—an effect that has not been demonstrated unequivocally in other species. PICKERING and PRINZMETAL[16] showed that in rabbits injection of renin produced extreme diuresis, with increased loss of sodium and chloride, associated with proteinuria amounting to 100 mg. per 100 ml. ADDIS et al.[17] described similar findings in the rat, but the proteinuria was more severe. Inactivation of renin with respect to the pressor response led to loss of capacity to produce proteinuria. In the adrenalectomised animal the production of proteinuria was almost abolished. HUGHES JONES et al.[18] showed that hypertensin was similarly active in causing polyuria in rabbits. The diuresis was shown to be due to inhibition of tubular capacity selectively to reabsorb sodium, chloride, and water. The sodium-chloride content of the urine approximated to that of plasma—which is typical of osmotic diuresis. It seemed most improbable that the diuretic effect was directly due to the pressor response. The polyuria was in some cases greatest when the blood-pressure had fallen to normal levels, and when the changes of the condition of glomerular filtration (shown by a raised filtration fraction) had disappeared. CROXATTO et al.[19] have further investigated this diuretic effect in rats. Adrenalectomy or hypophysectomy inhibited the response, but selective extirpation of the adrenal medulla was without effect. The administration of either cortisone or deoxycortone restored the response to normal. The greatest polyuria observed was in an animal which excreted in one day urine amounting to 42% of its body-weight. It seemed in general that sodium depletion tended to inhibit, and sodium excess to increase, the diuretic response. Since the dose of renin necessary to produce diuresis is greater than the effective pressor dose, it might be unsafe to extend similar observations to man. The fact that deoxycortone restored the diuretic response in adrenalectomised animals is of especial interest. It is now well known that cortisone restores the impaired diuretic response to ingested water in Addison's disease, whereas deoxycortone is inactive in this respect. A recent report[20] on the administration of the natural salt-retaining hormone of the adrenal cortex (aldosterone or electrocortin) in the treatment of Addison's disease suggests that this steroid is also inactive in restoring the diuretic response.

Encephalitis Viruses

IN the past thirty years we have learnt a good deal about the relationship between the many different viruses of epidemic encephalitis. Between 1915 and 1926 world-wide outbreaks of von Economo's disease appeared suddenly and then faded, leaving behind a residue of postencephalitic parkinsonism. The ætiological agent of von Economo's disease was never discovered, but its winter epidemic incidence differentiates it from newer forms of epidemic encephalitis which have appeared or been recognised since. The newer forms are usually localised to a particular geographic area which may appear to enlarge as investigations uncover more infected areas. The encephalitides include Australian X disease, recently identified with Murray Valley encephalitis[21]; the closely related Japanese B encephalitis, the virus of which has been responsible for outbreaks in Japan, China, Korea, and Malaya; the encephalitides of the

4. Blacket, R. B., Depoorter, A., Pickering, G. W., Sellers, A., Wilson, G. M. *Ibid*, 1950, **9**, 223.
5. Bradley, S. E., Parker, B. *J. clin. Invest.* 1941, **20**, 715.
6. Wilkins, R. W., Duncan, C. N. *Ibid*, p. 721.
7. Corcoran, A. C., Page, I. H. *Amer. J. Physiol.* 1940, **130**, 335.
8. Goldring, W., Chasis, H., Ranges, H. A., Smith, H. W. *J. clin. Invest.* 1941, **20**, 637.
9. Black, D. A. K., Platt, R., Rowlands, E. N., Varley, H. *Clin. Sci.* 1948, **6**, 295.
10. Daniel, P. M., Prichard, M. M. L., Ward-McQuaid, J. N. *J. Physiol.* 1954, **124**, 106.
11. Hamilton, M., Pickering, G. W., Fraser Roberts, J. A., Sowry, G. S. C. *Clin. Sci.* 1954, **13**, 11. See *Lancet*, June 12, 1954, p. 1224.
12. Haynes, F. W., Dexter, L., Seibel, R. E. *Amer. J. Physiol.* 1947, **150**, 198.
13. Langley, G. J., Platt, R. *Quart. J. Med.* 1947, **16**, 143.
14. Pickering, G. W., Heptinstall, R. H. *Ibid*, 1953, **22**, 1.
15. Longcope, W. T. *Ann. intern. Med.* 1937, **11**, 149.
16. Pickering, G. W., Prinzmetal, M. *J. Physiol.* 1940, **98**, 314.
17. Addis, T., Barrett, E., Boyd, R. I., Ureen, H. J. *J. exp. Med.* 1949, **89**, 131.
18. Hughes Jones, N. C., Pickering, G. W., Sanderson, P. H., Scarborough, H., Vandenbroucke, J. *J. Physiol.* 1949, **109**, 288.
19. Croxatto, H., Barnafi, L., Camazon, L., Parra, V. *Endocrinology*, 1954, **54**, 239.
20. Mach, R. S., Fabre, J., Duckert, A., Borth, R., Ducommun, P. *Schweiz. med. Wschr.* 1954, **84**, 407. See *Lancet*, June 12, 1954, p. 1226.
21. Burnet, F. M. *Amer. J. publ. Hlth*, 1952, **42**, 1519.

American continents (St. Louis, Eastern, Western, and Venezuelan equine); Russian Far Eastern encephalitis, reported from Russia and Siberia and recently from Czechoslovakia and Jugoslavia; and the closely related louping-ill, an encephalitis of sheep, rarely of man, in Scotland and the north of England, and our only representative of this group. The infectious agents of these diseases have some properties in common. They all characteristically produce summer outbreaks; all are small viruses with an extraordinarily wide natural and experimental host-range; and all are transmitted by biting arthropods. The localised geographic distribution of these infections, in contrast to the world-wide distribution of measles, influenza, and poliomyelitis, shows that man does not form the staple diet of the encephalitis viruses. Man is, in fact, a wholly dispensable link in a chain of infection which is made up in different cases of such widely different creatures as monkeys, horses, cattle, birds, mosquitoes, and ticks.

The relationship of the encephalitis viruses to one another and to certain tropical viruses, such as West Nile, Semliki Forest, and Bunyamwera viruses, has lately been investigated. OLITSKY [22] has suggested that many of these viruses may have had a common ancestor whose behaviour in different areas was conditioned by local insect vectors or animal and bird reservoirs of infection, and he cites the typhus group of diseases as a useful analogy. The demonstration of viral hæmagglutinins in tissues infected with some neurotropic viruses [23] and subsequently with various arthropod-borne viruses [24 25] suggested a new weapon for research into these diseases. CASALS and BROWN [26] have taken full advantage of this method, and by modifying the technique for extracting viral hæmagglutinins they have been able to study hæmagglutination by many different arthropod-borne viruses. They find that these viruses can be divided into two groups, on the basis of the temperature and pH required for the agglutination reaction. Group A, which require 37°C and pH 6·4, comprise Eastern, Western, and Venezuelan encephalitis and Sindbis, a virus recently isolated in Egypt. Group B, which agglutinate at 4°C or 22°C and pH 7·0, comprise dengue types 1 and 2, Ilhéus, Japanese B, Ntaya, St. Louis, Uganda S, West Nile, and yellow-fever viruses. Serological tests by the agglutination-inhibition reaction have confirmed the groupings; there were considerable cross-reactions among viruses within the A and B groups but none between sera of one group and viruses of the other. Indirect evidence also suggests that Semliki Forest virus belongs to group A and Russian Far Eastern and louping-ill viruses to group B. Earlier serological studies by neutralisation and complement-fixation tests had shown some cross-reactions among these viruses; and SMITHBURN [27] has now completed an intensive study of this subject. He has carried out cross-neutralisation tests in mice with most of the arthropod-borne viruses investigated by his colleagues,[26] and has found some new relationships not hitherto revealed by neutralisation tests. His findings agree in general with those of CASALS and BROWN, although the groupings shown by agglutination-inhibition tests are much clearer than those with neutralisation tests.

These most important studies may open the way to an understanding of how the different viruses have evolved from common ancestors, and of the factors underlying host differences and variations in virus pathogenicity in different areas. Perhaps, too, once these viruses have been neatly classified they may become more amenable to the efforts of those who are trying to domesticate them.

22. Olitsky, P. K. *Amer. Nat.* 1946, **80**, 401.
23. Hallauer, C. *Schweiz. Z. Path.* 1946, **9**, 553.
24. Sabin, A. B., Buescher, E. L. *Proc. Soc. exp. Biol., N.Y.* 1950 **74**, 222.
25. Chanock, R. M., Sabin, A. B. *J. Immunol.* 1953, **70**, 271.
26. Casals, J., Brown, L. V. *J. exp. Med.* 1954, **99**, 429.
27. Smithburn, K. C. *J. Immunol.* 1954, **72**, 376.

Annotations

BIRTHDAY HONOURS

ALL who have heard Sir Russell Brain's speeches and addresses in the past few years will have enjoyed their individual mixture of freshness and wisdom, and the remarkable range of his understanding. They will join with the fellows of his college in welcoming the new honour bestowed on a president who has the rare gift of bringing philosophy into affairs. Of the new knighthoods only one is conferred on a member of our profession in this country; but the choice is a most happy one, for Mr. R. C. Brock is one of those men who make medical history as well as writing about it. With his cardiological colleagues at Guy's he has helped to turn the possible into the practicable and the practicable into the useful, and in so doing has shown himself one of the most able exponents of one of the most progressive parts of surgery. It is a pleasure also to record the knighthoods conferred on two Australian colleagues, Dr. A. P. Murphy, F.R.A.C.P., and Mr. H. H. Schlink, and the various appointments to Orders which are set out on p. 1287.

RECOVERY HOMES

NOWADAYS patients well enough to leave hospital are not necessarily well enough—as the almoners have lately pointed out [1]—to go to convalescent homes; for such homes are not staffed or equipped to look after people who need any nursing or other special care. The convalescent homes committee of the King's Fund, with Sir Henry Tidy as chairman, have been looking into the "recovery homes" which some hospitals maintain, in order to decide what value they might have for the hospital service as a whole.[2] The committee thought at the outset that some existing convalescent homes might be adapted to take patients in the earlier stages of recovery, but experience has convinced them that it would not do. Most homes of the kind are not structurally suitable, nursing staff would be hard to get, and maintenance costs would go up. Recovery homes are set up and maintained by hospitals, which can of course supply the nurses. Only a few of the Metropolitan hospitals—and none of the London teaching schools—have recovery homes; but several large general hospitals elsewhere have established them, to relieve pressure on their beds. The Astley Ainslie Institution, attached to the Royal Infirmary at Edinburgh, the pattern recovery home of the country, defines itself as providing accommodation

"for patients in whom the disease has definitely begun to abate, or the risk of complications after operation is only slight, so that with proper care and nursing the patient is likely to progress to recovery."

The committee have adopted this definition. They visited ten hospitals and their country recovery homes,

1. Report on Convalescent Homes, to the Ministry of Health. Institute of Almoners, Tavistock House North, Tavistock Square, London, W.C.1; and see *Lancet*, June 5, 1954, p. 1176.
2. Recovery Homes. King Edward's Hospital Fund for London, 10, Old Jewry, London, E.C.2. Pp. 23. 1s.

and found the hospital authorities enthusiastic about the value of the plan. With one exception (a London hospital, far from country places) the homes were within a dozen miles of their parent hospitals.

All the authorities agreed that the home should be an integral part of the hospital, which supplies stores, food, drugs, and general services. The patients are visited at regular convenient intervals by senior residents and members of the consulting staff. At the homes which are over twelve miles from the parent hospital, the hospital arranges for a general practitioner to be on call in an emergency. About half the nursing staff are State-registered, and more or less permanent; student nurses take a turn of duty there, and find it stimulating, partly because of the rapid turnover of patients and partly because the trained staff have time to teach. The patients need the same skilled nursing care, and the same medical attention, as they would be getting in hospital, and the home provides it. Pre-students are sometimes allowed to do minor offices in the home; and this seems to be the one place where such young people may safely be allowed to come into contact with patients. (Such homes may therefore prove good training places for nursing cadets.) No operating-theatre or X-ray or other expensive equipment is needed, for these are all provided at the parent hospital.

The patients most suitable for admission are those with moderately severe medical, surgical, or gynæcological conditions who need 12–15 days in hospital and about the same time in the home. Long-term orthopædic, geriatric, or chronic cases should be sent elsewhere, for they quickly block beds and change the whole spirit and purpose of the home. The hopeful name, the change of scene, and the rapid turnover in population all have a part to play in helping patients to recover quickly, and go back home: at the end of their stay they should not need convalescent care as well. If patients are properly selected, only about 30% of the medical, surgical, and gynæcological beds will be found to be discharging their occupants to the home. A common fear among hospital authorities who have not set up such homes is that the increased turnover in the wards may throw too much extra work on the nursing staff. In fact there have been no complaints of overwork from ward staff; and even where the rate of turnover is at its highest the addition of one extra nurse to the ward has been enough to cope with it.

Hospitals usually buy country houses to convert into recovery homes. These commonly have good grounds in which patients can refresh themselves, and which will also provide a large part of the vegetables and fruit needed. One such house was converted at a cost of £800 per bed, and another at a cost of only £470 per bed. The cost of maintaining a patient in a recovery home is less than half the cost of maintaining him in hospital, so the total cost per patient falls. Though hospital waiting-lists are reduced, and turnover increased, the committee could not find any evidence of a recognisable increase in the maintenance costs of a parent hospital as a result of having a recovery home. These findings should reassure hospital authorities longing for a recovery home but fearing to take the plunge; it should also wake a spirit of adventure in those who have not so far contemplated the possibility.

NEEDLE BIOPSY OF LUNG

THE investigation of a case in which radiography has shown a pulmonary lesion often reaches an impasse, with no clue to the diagnosis from bronchoscopy and bronchography and examination of sputum or bronchial secretions for malignant cells, fungi, and tubercle bacilli. In these circumstances needle biopsy under fluoroscopic control is tempting; but, because of the dangers of air-embolism, hæmorrhage, and the dissemination of infected material or neoplastic tissue, most physicians prefer to transfer the case to the surgeon for exploratory thoracotomy. Dutra and Geraci [1] recommend needle biopsy of the lung for a limited class of cases: the clinical evidence should point to an incurable malignant condition, the lesion should be peripheral, and attempts by other methods to clinch the diagnosis should have failed. The area of skin nearest the mass is found by fluoroscopy and marked, and the biopsy is done with a Vim-Silverman needle. They consider that needle biopsy should not be done if surgical treatment seems feasible—a point that is emphasised by one of their cases in which an implant of neoplastic cells in the needle track led to a subcutaneous tumour.

ADRENAL HYPERPLASIA AND NEOPLASIA

IN the adrenal glands either a tumour (usually unilateral) or hyperplasia (which is bilateral) can produce virilism.[2] The abnormality is associated with a large excretion of 17-ketosteroids in the urine. When congenital it produces macrogenitosomia præcox in the male and pseudo-hermaphroditism in the female; there is often also a defect in the regulation of salt metabolism.[3 4] If the abnormality arises after the external genitalia have developed in the fourth month of fœtal life, then in the female the result is simply virilism, with hirsutism and enlargement of the clitoris. The male still shows macrogenitosomia if the lesion is prepubertal; since the adrenals are responsible for the abnormal output of hormone, the testes remain infantile, and in this way the disorder can be distinguished from other types of precocious puberty in the male. It is obviously difficult to recognise the abnormality in the male after puberty.

In congenital cases hyperplasia is the usual lesion; but otherwise a tumour—not necessarily malignant—is more common than hyperplasia, particularly before puberty. In either case the pattern of steroids secreted by the adrenal is abnormal.[5 6] Jailer et al.[7] have ably reviewed the effect of large doses of cortisone on the high output of 17-ketosteroids. From their own wide experience, and from the results reported by others, they show that cases of hyperplasia respond with a fall in 17-ketosteroids whereas cases of tumour do not. Cortisone usually produces a remission in virilism associated with adrenal hyperplasia, presumably by inhibiting the pituitary; but tumours of the adrenal seem to be independent of pituitary control and operation is the only treatment.

In Cushing's syndrome the secretion of the normal adrenal hormone is excessive; but there may be an abnormal pattern, and virilism and Cushing's syndrome can occur together. Although the results were less clear-cut than in virilism—the excretion of 17-ketosteroids in Cushing's syndrome is not necessarily very high—Jailer et al. found that the "cortisone test" may also be useful in differentiating tumour and hyperplasia of the adrenal in Cushing's syndrome. A tumour requires a unilateral operation. For hyperplasia producing Cushing's syndrome bilateral subtotal adrenalectomy may be required if the condition is progressive and disabling; destruction of the pituitary has also been tried successfully.

These are uncommon diseases. Virilism must be distinguished from simple hirsuties, and adrenal virilism

1. Dutra, F. R., Geraci, C. L. *J. Amer. med. Ass.* 1954, **155**, 21.
2. Jailer, J. W. *Bull. N.Y. Acad. Med.* 1953, **29**, 377.
3. Wilkins, L., Fleischmann, W., Howard, J. E. *Endocrinology*, 1940, **26**, 385.
4. Harris, C. F., Scowen, E. F. *Arch. Dis. Childh.* 1951, **26**, 423.
5. Pond, M. H. *J. Endocrin.* 1954, **10**, 202.
6. Bongiovanni, A. M., Eberlein, W. R., Cara, J. *J. clin. Endocrin.* 1954 **14**, 409.
7. Jailer, J. W., Gold, J. J., Wallace, E. Z. *Amer. J. Med.* 1954, **16**, 340.

from that produced by hypothalamic,[8,9] pituitary, and gonadal disorders.[2] The diagnosis of Cushing's syndrome requires evidence of adrenal over-activity; and many women with obesity, hirsuties, hypertension, and diabetes have not got this syndrome. But the few unfortunate patients who have adrenal disorders can often be helped.

TOWARDS CLEAN AIR

FOR centuries private citizens and public committees have talked of smoke abatement. The outlook, however, has so steadily darkened that the "six counties overhung with smoke" which William Morris found such difficulty in forgetting, are now indistinguishable from most of their neighbours. The National Smoke Abatement Society (N.S.A.S.) in a memorandum [10] addressed to the Committee on Air Pollution (the Beaver Committee), say that the reason effective action has never been taken is because there has never been an informed determined public demand for it. The London fog disaster of 1952, however, sharply increased interest in air pollution; and people are readier than they have ever been to attend to its causes and press for remedies.

The society believe the subject to be of such importance that smoke prevention should be among the first factors considered when the use of fuels is under discussion; and that all fuel policies, developments, and propaganda which are not in the interests of smoke prevention (such as propaganda for the overnight use of bituminous slacks on domestic fires) should not be countenanced. No change in legislation would be needed to achieve this—only a change in outlook among those responsible for fuel policies. Many other preventive measures could be applied under the existing laws: coal could be better cleaned, so that it emitted less sulphur dioxide and grit when it was burned; different types of plant could use appropriate grades of coal for smoke prevention, and the quality supplied could be consistent; stokers could be better trained; fuel-burning plant could be better maintained and managed, and the rate of modernising plant could be hastened; both in industry and in the home the use of gas and electricity could be extended; and the replacement of raw coal with solid smokeless fuel might proceed much faster than it does. Some 37 million tons of smokeless fuel is produced annually in Great Britain, of which only 5 million tons is available for domestic purposes. It has been estimated that—partly by increased production and partly by withdrawals from other markets—10 million tons could be made available for domestic use by 1957, and 15 million tons by 1962. Meanwhile the society urge that available supplies of smokeless fuels should be sent to areas which will benefit most from their use—such as smokeless zones.

Naturally research is needed, not only to develop new processes for the production of smokeless fuel, but on such pollution problems as the removal of sulphur dioxide, grit, and dust from flue gases; and on the pollution caused by steel and clay industries, coke ovens, cement manufacture, lime-burning, chemical processes, and road-vehicle exhausts. The last is an up-and-coming nuisance which we should do well to scotch in time. Diesel fumes thicken on our roads; and the plan to exchange London's 1800 clean and silent trolleybuses for diesel-engine motor-buses has already caused many protests.[11]

Again, the N.S.A.S. think that local authorities proposing schemes for reducing air pollution get too little encouragement. Initiative of this kind, they say, should be not only approved but stimulated by the Government; for too many local authorities are still inactive.

The law about smoke has remained substantially the same for three-quarters of a century, and is almost entirely of the too-late variety (in the sense that action can only be taken after a nuisance has been caused). The society suggest that new legislation should not only give local authorities better powers for setting up smokeless zones but should enable them to proceed against manufacturers whose chimney emissions exceed prescribed standards. It should also oblige manufacturers who are putting in new fuel-burning plant to have their plans approved beforehand by the local authority. Moreover, all boiler-men and furnace-men should be required to hold a certificate of proficiency; and local authorities should be obliged to employ only fully qualified smoke inspectors. Finally, the society suggest, the installation in houses or hotels of grates which cannot burn smokeless fuel should be prohibited.

The society, in their steady education of the public in this matter, have done good work and done it on a very small budget. They are fully justified in suggesting that they deserve a Government grant towards it, for no agency is better placed for creating the informed public opinion which alone can lift the cloud from us.

RECURRENT PANCREATITIS

PANCREATITIS is apparently commoner in North America than here. Several accounts of this disease have appeared in the U.S.A. during the last few years [1–3]; and at the recent meeting in London of the American College of Surgeons Prof. Walter C. MacKenzie described his extensive experience of it in Canada.[4] According to Phillips,[3] it is usually a chronic relapsing disorder in middle-aged alcoholic men. There is a fairly characteristic pattern of attacks of upper abdominal pain, recurring on average three or four times a year, which are often precipitated by alcoholic or dietary indiscretion or by worry or fatigue.[2] The attack may be mild, lasting only a few hours, or of the severe "acute hæmorrhagic" type that continues for several days. Vomiting is usual and there may be mild diarrhœa; pyrexia is seldom pronounced; loss of weight during the attack may be severe. In uncomplicated cases the patients are free of symptoms between attacks. Eventually fibrosis may lead to cyst formation or to calcification, which may be localised or diffuse. Occasionally severe fibrosis may produce bile-duct obstruction, but this is probably rare.

Confirmation of the diagnosis by clinical tests is often difficult. Radiographic evidence of pancreatic calcification, the presence of steatorrhœa, creatorrhœa, or glycosuria, or a raised serum amylase or lipase level are highly significant. But such evidence is to be expected only in severe attacks or when repeated episodes have considerably damaged the gland. In mild attacks and between bouts, investigations often yield negative results. Examination of the duodenal contents after administration of secretin has been recommended, but this test is tedious and difficult and the results are inconstant. With pancreatitis, as with so many diseases, the case-history is often a better guide than a group of tests. The acute episode is best treated conservatively with analgesics (but not morphine) and antibiotics. Atropine or, better, 'Probanthine' is given to decrease gastric and pancreatic secretion, and to relax the

8. Morley, T. P. *J. clin. Endocrin.* 1954, **14**, 1.
9. Bauer, H. G. *Ibid*, p. 13.
10. To be had from the National Smoke Abatement Society, 30, Grosvenor Place, London, S.W.1. 1954. Pp. 15. 1*s*.
11. *Times*, May 6, *et. seq.*

1. Maimon, S. N., Kirsner, J. B., Palmer, W. L. *Arch. intern. Med.* 1948, **81**, 56.
2. Hersperger, W. G. *Sth. Med. J.* 1949, **42**, 289.
3. Phillips, A. M. *Arch. intern. Med.* 1954, **93**, 337.
4. See *Lancet*, May 29, 1954, p. 1126.

sphincter of Oddi; in an acute attack withdrawal of secretion through a Ryle's tube is valuable. Operation between attacks may be necessary if cysts are present, or to deal with associated biliary-tract infection. In addition, thoracolumbar sympathectomy, vagotomy, sphincterotomy, and pancreatectomy—alone or in various combinations—have all been tried, and "beneficial results are reported after each procedure." [3]

The cause of pancreatitis is still undetermined. Opie [5] suggested that it is due to reflux of infected bile along the pancreatic duct, and this view has been widely held. There are, however, several objections to it, the chief of which is that pancreatitis without associated biliary-tract disease is not rare. Some observers [3 6] have, in fact, claimed that biliary disease, when present, is the result of the pancreatitis. Virus infections, such as mumps and virus pneumonia, may produce isolated acute attacks, but seem unlikely to be responsible for recurrent episodes. Probably one clue to ætiology lies in the high incidence of chronic alcoholism among patients with recurrent pancreatitis. Possibly chronic alcoholic gastroduodenitis produces œdema round the duodenal papilla, with consequent obstruction to the flow of pancreatic juice, followed by stasis and infection within the ducts.[3] Klatskin and Gordon,[7] in a study of familial essential hyperlipæmia with associated pancreatitis, found evidence suggesting that the former condition preceded and might cause the latter. But the majority of patients with recurrent pancreatitis show no sign of hyperlipæmia; and Professor MacKenzie believes that the essential factor is the development of a vascular lesion while the gland is under a pronounced secretory stimulus.

PROPHYLAXIS OF MEASLES COMPLICATIONS

In the U.S.A. gamma-globulin for the prophylaxis of measles in contacts has been obtainable until recently at the corner drug-store; but in the last year it has been temporarily withdrawn from the market owing to its wide use in the prophylaxis of poliomyelitis. This has had the effect of focusing attention on prevention of the bacterial complications of the disease by chemotherapy.

For some years the usual practice has been to give sulphonamides, or sometimes penicillin, to young children with measles for five or six days after the appearance of the rash, as a protective "umbrella" against pneumonia, otitis media, and other bacterial complications; and this has proved strikingly successful.[8–11] Karelitz and his associates [12] at the Willard Parker Hospital, New York, have now tried the effect of a single injection of the repository form of benzathine penicillin in 61 children with measles, and only 2 developed bacterial complications. The controls were 67 patients who received on admission four daily injections of aqueous procaine penicillin 300,000 units, 47 who received aqueous penicillin 600,000 units on alternate days for three doses, and an untreated series of 41 children. These groups were formed by alternate allocation of patients on admission, except that those with complications already present were alternated in the penicillin groups, which were thus fairly severely weighted. No bacterial complications occurred after admission to hospital in the procaine penicillin groups, but of the untreated controls 28% had complications—mainly pneumonia. Karelitz et al. suggest that it is now clear that most bacterial complications of measles can be avoided by timely antibiotic therapy; and aqueous procaine penicillin, being relatively painless, has advantages over other depot penicillins. In this country quite satisfactory prevention of bacterial complications can still be obtained by the simpler and cheaper method of sulphonamide prophylaxis. This is one of the few forms—if not the only form—of routine sulphonamide prophylaxis that can be generally recommended.

5. Opie, E. L. *Bull. Johns Hopk. Hosp.* 1901, **12**, 182.
6. Gambill, E. E., Comfort, M. W., Baggenstoss, A. H. *Gastroenterology*, 1948, **11**, 1.
7. Klatskin, G., Gordon, M. *Amer. J. Med.* 1952, **12**, 3.
8. Banks, H. S. The Common Infectious Diseases. London, 1949; p. 114.
9. Holbrook, W. P. *J. Amer. med. Ass.* 1944, **126**, 84.
10. Coburn, A. F. *Ibid*, p. 88.
11. Karelitz, S., King, H., Curtis, B., Wechsel, M. *Pædiatrics*, 1951, **7**, 193.
12. Karelitz, S., Chang, C. C., Matthews, Z. E. *J. Pediat.* 1954, **44**, 357.

"ARTIFICIAL HIBERNATION" IN THE WOUNDED

Not uncommonly severe injury is followed by a vasovagal reaction, which may possibly aid survival. Such a reaction can be prolonged by means of "artificial hibernation," which Huguenard [1] has defined as controlled inhibition of the autonomic nervous system with lowered metabolism, muscular relaxation, and twilight-sleep. Laborit and other French workers have brought about this "physiological alienation," in order to prevent or treat shock,[2] by means of various drugs, including a "lytic" mixture of chlorpromazine hydrochloride ('Largactil'), promethazine hydrochloride ('Phenergan'), pethidine, and diethazine hydrochloride ('Diparcol').

Last year, after visiting the front in Indo-China, Laborit and Huguenard [3] suggested that such a mixture might usefully be administered to the wounded at any stage of evacuation behind the regimental aid-post. In the past year this method has been applied to nearly 250 casualties; and Chippaux et al.[4] compare the results with those in a group of similar casualties treated by orthodox methods. They conclude that in 10 of 51 severely injured patients who died after orthodox treatment, the outcome might have been different if the lytic mixture had been given. This technique, they say, should be practised only at the place where full resuscitation and surgical treatment are to be carried out, after diagnosis and a decision about operation. The method does not reduce the amount of blood required for replacement, and its use should be preceded by full resuscitation. In Indo-China the conditions most likely to be benefited seemed to be severe burns, shock resistant to transfusion, blast injuries, and hyperpyrexia. The advantages are said to include easier anæsthesia with smaller doses, prevention of operation shock, and greater comfort in the early postoperative period. Against these must be set the difficulties of applying the method in the forward area, where the treatment of the most severe battle injuries is best undertaken; the need to observe the comatose patient closely for thirty-six to forty-eight hours; and, in the tropics, the necessity for air-conditioned accommodation.

These observations do not finally decide the value of "artificial hibernation" in the field; but at present this seems very limited.

1. Huguenard, P. *Anésth. Analg.* 1953, **10**, 16.
2. See *Lancet*, 1953, ii, 1039.
3. Laborit, H., Huguenard, P. *Pr. méd.* 1953, **61**, 1029.
4. Chippaux, C., Carayon, A., Rouffilange, F., Fabre, A., Borjeix, L., Lapalle, J. *Ibid*, 1954, **62**, 504.

MESSRS. CHRISTIE

Under the heading of "In England Now" last week, a correspondent told the story of some people living in a caravan who owned a picture by Turner and were supposed to have had an offer of £6000 for it from a representative of Christie's. To anyone with knowledge of such affairs, this statement showed that the story could not be wholly veracious; for, though Messrs. Christie, as auctioneers, have been selling works of art for two centuries, they have never bought them or made offers of the kind described. We are sorry to have caused Messrs. Christie annoyance by this misleading mention of their name.

Special Articles

FEEDING CONVALESCENT PATIENTS

NUTRITIONAL NEEDS AND PRESENT COST *

A. P. MEIKLEJOHN
D.M. Oxfd, M.R.C.P.

LECTURER IN NUTRITION, DEPARTMENT OF MEDICINE, UNIVERSITY OF EDINBURGH; CONVENER, CATERING COMMITTEE, ASTLEY AINSLIE, EDENHALL, AND ASSOCIATED HOSPITALS BOARD OF MANAGEMENT

THE National Health Service Act for Scotland, 1947, enjoins hospital boards to provide "general services" for the hospitals in their charge. As yet there has been no precise definition of what these services should be. So far as I know, the first attempt at any such definition was made in a recent editorial in THE LANCET (March 20, 1954) which said: "the responsibility of hospital managements is to provide an efficient hospital, to keep it warm, clean, and wholesome, to furnish it for the adequate reception of patients, to supply it with the necessary food and medicine, and to employ a competent staff." This seems a good definition which might well provide the basis for future legal interpretations of the Act. In that event we would have to consider carefully what is meant by "necessary food." In fact we might have to consider it very carefully indeed. Now that any dissatisfied patient can ask for free legal aid, it is quite possible that before very long a hospital board might find itself sued for failing to provide "necessary food." The expert evidence in such a case would be interesting and probably so contradictory and confusing as to embarrass even the lawyers.

I want to attempt some definition of what should be meant by "necessary food" for convalescent patients, not out of any special desire to help the lawyers in their task—still less to provide material for office-desk directives—but because I believe that all of us concerned with the care of convalescent patients want to see them properly fed and are now anxious about how this can be done on our present budgets.

"NECESSARY FOOD" FOR CONVALESCENCE

It is surprising that no recent textbook of medicine, surgery, or therapeutics seems to pay any special attention to the general nutritional needs of convalescent patients, though they sometimes give advice about feeding during recovery from certain specific diseases. Some of this advice dates from an age when medicine was more elegant, though perhaps less efficient than it is today—e.g., the importance of avoiding overcooked meats, or game that has been allowed to get "high." A new British textbook of medicine edited by Garland and Phillips (1953) provides an admirable essay by Dr. T. F. Main on the special problems of convalescence and rehabilitation, particularly the psychological problems; it is an essay well worth study. And yet, surprisingly, the book makes no mention of nutritional needs in convalescence.

The provision of food for convalescent patients presents quite a different problem from feeding patients in the wards of a general hospital. In a general hospital there are always some patients who are too sick to take more than a light diet. The other patients benefit accordingly; for the catering officer, with a fixed allocation per bed of foods such as meat and butter, has usually a comfortable surplus to distribute. Convalescent patients, on the other hand, whether at home or in homes or hospitals, should be eating at least a full well-balanced normal diet. I say "at least" on purpose, because there are several categories of convalescent patients who actually need *more* food than a normal healthy person.

SPECIAL NUTRITIONAL NEEDS IN CONVALESCENCE

It is no fault of the general hospitals that many of the patients they discharge to convalescent homes are actually in a state of subnutrition or malnutrition. In fact it is the correction of these inevitable nutritional deficiencies that is an essential part of what we mean by convalescence. These deficiencies are inevitable because they are the unpreventable aftermath of acute illness, operation, or injury. Here are some examples.

Calorie-deficiency (Subnutrition) Following Fevers

Loss of appetite is a common complaint in many acute febrile diseases. In the old days the doctor used to aid the process by denying his feverish patients all food, except perhaps an occasional cup of meat extract (devoid of calories) and a sliver of desiccated toast. The patient with a long-continued fever, such as typhoid, might recover from the infection only to die in the end of starvation. The first opponent of this mistaken regimen was the great Irish physician Graves, who asked that his tombstone should be inscribed with this epitaph: "He fed fevers." But for many years he had few followers. Today we try to coax the feverish patient to take as much food—as many calories—as he will accept by feeding him fluids and semi-solids of high energy value; not meat extract and "ice-creams" made of seaweed, but sustaining soups in which a whole meal is concentrated and made tasty, and puddings containing plenty of milk or concentrated milk-protein.

The advent of the antibiotics has undoubtedly greatly reduced the extent of subnutrition and starvation resulting from long febrile illnesses, because they have curtailed the number of days on which the patient is unable to eat. Even so, I suspect that there are still many patients recovering from fevers who have a great deal of nutritional leeway to make up. A familiar example is the child who has ceased to grow during an attack of whooping-cough, through losing calories by recurrent vomiting.

Malnutrition (Deficiency of Specific Nutrients) Resulting from Injury

Loss of nitrogen.—It is now generally recognised by surgeons that the common process of putting a patient to bed, giving him a general anæsthetic, and making a simple skin incision—no more than that—is enough to put him into "negative nitrogen balance." In other words his tissues begin to break down, liberating protein which is katabolised. The nitrogen liberated by this katabolism is excreted, so that more nitrogen appears in the urine than is taken in the food and a state of negative balance ensues. If, in addition, there is serious injury the negative balance will be correspondingly severe. Many surgeons have attempted to check this biological reaction to injury by giving heroic quantities of protein immediately, either by mouth in the form of concentrated milk-protein, or by intravenous infusion of protein hydrolysate. But the general opinion now seems to be that the effort is doomed to failure because it is impossible to arrest, at the time, this reaction involving the destruction of protoplasm. It is only during the stage of recovery—during convalescence—that the lost protoplasm can be replaced.

Loss of ascorbic acid (vitamin C).—Recent work has drawn attention to the relatively enormous amounts of ascorbic acid that may vanish from the body immediately after an injury, such as a fracture or burn. The body, when fully saturated with the vitamin (which few British people are) may contain 6 g. of the vitamin; as much as 4 g. may disappear overnight after an accident. It seems likely that the corticotrophin discharged from the anterior pituitary gland in such

* Lecture delivered on April 24, 1954, to a conference on Convalescent Homes arranged in London by King Edward's Hospital Fund.

circumstances, is responsible for this rapid disappearance of ascorbic acid; the liberation of this hormone from the anterior pituitary is known to be one important aspect of bodily reactions to damage. This loss of ascorbic acid must be made good during the period of recovery, and the diet must supply it because man, like the guineapig but unlike the rat, cannot make it for himself.

Loss of calcium.—A remarkable experiment carried out in America recently showed that when a normal man is put to bed immobilised in a plaster cast from chest to toes, his body goes into "negative calcium balance"—i.e., he loses more calcium in his excreta than he receives in his diet. The fact is that when for any reason any part of the skeleton is immobilised it loses calcium salts, becomes demineralised, and is thus weakened. The strength of the bones is maintained only by constant use. We know too well how elderly bedridden patients may by immobilisation lose so much calcium from their bones that, when they do get up, they break a hip as soon as they put any weight on it. The occupational therapist and physiotherapist, by providing active movements for bedridden patients, not only keep the muscles from atrophy but help to maintain the strength of the bones.

Dietary Sources of Calcium, Ascorbic Acid, and Nitrogen

By far the most valuable dietary source of calcium is milk, and the milk-protein contained in cheese. Ascorbic acid is provided by fresh fruit and vegetables, nitrogen by foods of animal origin—meat, fish, eggs, milk, cheese.

Of course all these foods are regularly provided in convalescent diets; but are they always provided in adequate amounts? Before attempting to answer that question, it is worth considering first what constitutes an adequate diet for a normal adult.

Definition of an Adequate Diet for a Normal Adult

It is impossible to predict from published tables of nutritional "requirements" just how much of each class of nutrient a patient needs: needs vary very widely and unaccountably from one individual to another. But it is useful nevertheless to have certain standards—"recommended allowances"—against which to judge the adequacy of diets. Such standards have been provided by the British Medical Association's Committee on Nutrition (1950). A normal adult should be able to maintain a satisfactory state of nutrition on the following approximate daily (intake) allowances:

Calories: 2000 to 4000 according to age, sex, and activity.
Protein: At least 70 g.
Calcium: 1 g.
Iron: 12 mg.
Vitamin A: 2500 I.U.
Thiamine: 1 mg.
Ascorbic acid: 30 mg.

What do these amounts mean in terms of actual foodstuffs? This may be learnt from a study of the reports of the National Food Survey carried out by the Ministry of Food during the 1939–45 war and after. This survey shows that the average diet of urban households has been, in recent years, sufficient to meet the B.M.A. recommended allowances. The average daily consumption of different foodstuffs[1] therefore provides a useful guide to the quantities of different foods, available on the market, necessary to provide an adequate diet for a British household. This publication also provides a valuable index of the rising cost of food.

THE COST OF FOOD

Cost of an Adequate Household Diet

Twenty years ago the British urban population was spending on average about 9*s*. per head per week on food. Times and costs have changed since then! We know that before the war the diets of many urban families were seriously deficient in several respects. With the introduction of rationing during the war the average level of nutrition actually improved, while the price of food was kept low by subsidies.

For various technical reasons the figures given by the National Food Survey for the cost of an average urban diet are not strictly comparable from year to year. However, I do not think that the scientific advisers of the Ministry of Food will quarrel with me seriously when I give the following personal estimate of the changing cost of a household diet adequate to meet the B.M.A. standards, making due allowance for the relative inefficiency of the housewife in her choice of the best foods to buy:

Estimated Cost of an Adequate Household Diet (per head weekly)

1942–43	11/–
1946–47	11/6
1950	16/6
1951	19/6
1953	24/–

These figures are obviously only approximate, but I think it true to say that the over-all price of food has more than doubled in the last seven years and that an average urban family would not now be able to purchase an adequate diet for much less than 25*s*. per head per week. Fortunately many families have enjoyed a parallel increase in wages (earned from the rising prices); but it is hard on old people with fixed incomes, and also hard on hospitals. In budgeting for hospital catering we must dismiss from our minds all former ideas about what this should cost, and accept the fact that, as regards food at least, we are living in times of inflation.

Obviously it would be foolish, without full knowledge of the economic facts, to question the wisdom of lifting the subsidised lid on food prices. There are already signs that the price of some foods is falling. But meantime it seems reasonable to express the hope that the Ministry of Health understands what the Ministry of Food is doing.

Hospital Costs and Household Costs Compared

It may be argued that a hospital should be able to provide food at much less cost than the ordinary household, by reason of wholesale purchases. This is certainly true to some extent, but against this must be reckoned certain factors that may add to the catering costs of hospitals.

Age of the patients.—The figures I have given for the cost of domestic feeding are in terms of a household budget divided by the number of members in the family, including small children whose nutritional needs are obviously much less than those of an adult. A hospital providing mainly for adults would have to purchase more food per head than the average household.

Special nutritional needs in convalescence.—I have already given some reasons why convalescent patients should have ample supplies of milk, meat, and fresh fruit and vegetables as a necessary part of their treatment.

Milk

The average household purchases about 5 pints of milk per head per week. In my opinion a convalescent hospital should provide *at least* 7 pints at an additional cost of about 1*s*. per head per week.

Meat

Meat seems to be rationed more by price than anything else now, and I suspect that many families have had to alter their eating habits and accept stews made from the cheaper cuts in place of the traditional roast. It is clearly important that convalescent hospitals should not imitate the public in this respect, and attempt to save money by debasing the quality of the food they serve. A diet, to be therapeutically useful, must be appetising. The quantity of meat purchased may look very impressive on paper, but it is useless if it is inedible.

Fruit and Vegetables

Likewise I suspect that some households now find the price of many fruits and vegetables prohibitive, particularly

1. Domestic Food Consumption and Expenditure, 1951. H.M. Stationery Office. 1953.

in the first months of the year. The ascorbic acid which they provide is the one vitamin that is commonly consumed in insufficient amounts in Britain.

A great deal of this vitamin is destroyed in the appalling traditional ways of cooking potatoes and other vegetables. The average domestic diet contains 50–70 mg. per head per day (according to season) before it is cooked, but a large part of this is destroyed in the cooking. By American standards we are certainly all of us deficient in this vitamin. Although I doubt whether keeping the body saturated with it is really necessary for health, as the Americans think, I believe that many British people—especially in the spring—have inadequate bodily reserves of ascorbic acid. A survey of blood-ascorbic-acid levels among hospital patients would almost certainly show an important proportion with little or no measurable amount of the vitamin at this season of the year.

The average domestic household spends about 1*s.* per head per week on fresh fruit. I would think that a convalescent hospital ought to be spending at least twice this amount, if its patients are to recover quickly from the loss of ascorbic acid sustained as a result of surgery or injury.

VALUE OF A GARDEN

At the Astley Ainslie (Convalescent) Hospital in Edinburgh we have the inestimable advantage of well-kept gardens. These provide a pleasant environment in which patients may rest, relax, and recover. In my opinion the cost of maintaining them is money that is far more usefully spent towards the benefit of patients than the large sums sometimes expended on drugs of dubious value in hospitals less fortunate.

But more important than the psychotherapeutic amenity that gardens provide are the fruit and vegetables they produce. The Astley Ainslie Hospital has $8^1/_2$ acres of land devoted to market gardening, which grows a substantial part of the requirements for fruit and vegetables for a hospital of 240 beds. Fruit and vegetables sold in the markets of large cities have often been "processed" in various ways to maintain their appearance, though not necessarily their nutritive value. The ascorbic acid content of vegetable foods deteriorates rapidly with keeping. To be able to give convalescent patients fruit and vegetables fresh from the garden, without spoilage, is a most important means of providing the ascorbic acid they need, and incidentally it is more enjoyable for them than vitamin pills.

There can be no dispute that a garden is a priceless asset to a hospital, and any attempt to reduce its productivity in the name of economy should be resisted on medical grounds.

VITAMIN PILLS

It is fashionable at the present time to prescribe multi-vitamin pills of various kinds to convalescent patients. The doctors who prescribe them have probably very little notion of what is in them. They may notice that they contain pyridoxine and pantothenic acid and think that this is all very scientific and good. But there is no evidence that the human body needs these particular vitamins in its food; in fact there are reasons for believing that pyridoxine may be injurious, if the diet is deficient in another component of the B-complex—thiamine.

Vitamin pills are no substitute for food, and personally I know of very few medical uses for them. Admittedly they are valuable in the immediate treatment of beriberi, pellagra, and scurvy, but these diseases are almost extinct in Britain. My personal view is that no convalescent patient should require synthetic vitamin pills if he is provided wtih proper food.

Before the discovery of the vitamins, every patient in hospital had a bottle of medicine; often it was mostly infusion of gentian or some other bitter tonic intended to stimulate the patients' appetites for the nauseous meal that they were about to receive. Fortunately the members of the British Dietetic Association, with well-trained cooks and catering officers, have so improved the standard of hospital feeding that tonics are no longer necessary.

PRESENT COST OF A CONVALESCENT DIET

But to return to the main theme; what is the minimum cost of an adequate convalescent diet? I think that today it would be difficult adequately to feed convalescent patients on much under 25*s.* a week, at least at the food prices current in Edinburgh.

At the Astley Ainslie Hospital, during the first two months of this year, we were actually spending 23*s.* 9*d.* a week on food; but then we have the advantage of our own market garden. This compares with the average figure of 12*s.* 6*d.* a week that we were spending during the twelve months April–March, 1946–47.

How do we know that the diet we are providing is adequate? I have obtained the records of kitchen allocations of food at the Astley Ainslie Hospital for a sample week in March, 1954, and had them calculated in terms of calories and nutrients. I am glad to say that they meet the B.M.A. standards, even allowing for inevitable cooking losses. But there is not a great deal to spare, keeping in mind the special nutritional needs of convalescent patients.

I would be the last to suggest that we should have periodic visitations from official dietetic auditors to tot up the calories in the kitchen, along with the petty cash; but I do suggest that every convalescent home or hospital should review for itself periodically the standard of its feeding, preferably with the help of a trained dietitian, to make certain that minor economies have not been allowed insidiously to undermine the standard.

COMMENT

It is ironical that at this time, when civilian rationing is at last coming to an end, hospitals are finding it necessary to impose their own system of rationing food in order to keep down expenditure. I suggest that they ought to think very carefully before they do so. I have heard of one hospital where it was recently proposed that they should economise on their milk bill, while at the same time the medical staff was freely prescribing injections of expensive antibiotics which were sometimes given for days after the patient really needed them "just to make sure," or because no-one had remembered to cross the order off the treatment sheet. If economies must be made, I suggest that we scrutinise first the drug bill—and especially the bill for synthetic vitamins.

Good food is an essential part of proper convalescent treatment. It is obviously false economy to employ an expensive staff to look after convalescent patients whose recovery is postponed and delayed because they are not getting proper food.

AN AMERICAN IN BRITAIN

Dr. J. H. Cort, a citizen of the U.S.A. who is lecturer in physiology in the University of Birmingham, was ordered last week to leave Britain by June 30.

Dr. Cort issued the following statement:

I came to this country for the second time in June, 1951, directly after completion of medical school at Yale University. My research interests at Yale had been in electrolyte metabolism and renal physiology, and I was awarded a research fellowship for two years with R. A. McCance at Cambridge. For two years, while a medical student, I had been a member of the American Communist Party. My sole political activity during that period was as a member of the Association of Internes and Medical Students, advocating health insurance and a national health service in the United States. This political activity ceased after medical school, and I have now no political affiliations or activities. I left the U.S. lawfully, with a valid passport, in May, 1951. In November, 1951, the American Embassy in London demanded the return of my passport and my immediate return to the United States. I

asked the reason for this request, but was told only that the State Department had issued the request and that no reason could be given. I was very loth to comply since I had only been in my fellowship for three months, and I had also registered as a research student at Cambridge. My legal adviser informed me that there was no legal compulsion in the request, and since I had very little reason to expect that scientific employment would be available for me under present conditions in the U.S. I did not comply with the request. In June, 1952, my passport expired. I applied for renewal of permit to stay, and the Home Office granted this with full knowledge of my status.

In the course of the next year, the Congressional Committee on Un-American Activities began investigating "subversive activity" in American universities, and, in the course of their hearings at Yale and in Boston, many of my old acquaintances were asked if they knew me, I being identified as a member of "a secret Communist cell" at Yale. These identifications were publicly printed, appearing in some detail in at least a dozen American newspapers. All of my friends who refused legally to testify were dismissed from university posts except one at Harvard. There, the university refused to dismiss him, but the Massachusetts authorities have indicted him for violating his oath to the university and the State, even though the university is not the complainant, and he is awaiting trial at present. Later, the U.S. Army began a loyalty oath programme, under which all candidates for call-up and commission were required to list all political organisations with which they had been connected. If membership of any organisation on the official "subversive list" was admitted, past or present, or if the candidate legally refused to fill in the form, he was called up as a private, regardless of medical qualifications or experience. Two of my friends so inducted have subsequently undergone court-martial for subversive activity supposedly undertaken before military service, and one has been dishonourably discharged. Last month, the U.S. Army's policy was changed, so that former and present Communists and "subversives" are not allowed into the armed Services at all.

Because of these considerations I considered that I would find it impossible to continue my scientific and medical career in the United States, and I applied in December, 1952, for a lectureship in physiology at the University of Birmingham, a permanent position. This post was awarded to me in February, 1953. In March, 1953, I received an order to appear for examination and induction into the U.S. Army either in America or Germany. I again took legal advice, and was informed that under British and international law I could only receive notice of intention, but that no legally binding notice could be served on me by a foreign government in the United Kingdom, and that my only legal obligation was to report for service upon returning to the jurisdiction of the demanding authority. I therefore did not report as ordered. The order was repeated several times, despite the fact that my parents informed the U.S. authorities of my legal position. After taking up my duties in Birmingham, the Home Office again renewed my permit to stay.

In December, 1953, I was called to the criminal investigation department of the Birmingham Police to have a message from the U.S. Embassy read out to me and to have a reply taken. This message stated that:

(1) I was a delinquent, and had violated American Law.
(2) I had left the U.S. without permission.
(3) I had refused to obey legally binding call-up orders.
(4) I had left the U.S. for the purpose of evading National Service.

The wording of (4) was important since the message went on to say that, under the McCarran Law, this last charge would be used to remove my U.S. citizenship. I was unable to get any legal advice here that professed competence in U.S. law, so that I was forced to give an official answer that merely stated that I denied the charges, and that I refused to give a detailed statement to the U.S. authorities through the agency of the criminal investigation department of the British Police, but that should the Home Office require any information I should be happy to furnish it. For the purpose of this statement, may I state in answer to the charges:

(2) I left the U.S. with a legally valid passport. I registered with the army authorities before I was legally required to do so in order that I might be able to travel in time to take my position at Cambridge. I asked the army authorities and the University (Yale) consultant on military service whether there were any formalities in leaving for my post, and I was told that there were none, and that I should leave.
(3) These orders were not legally binding.
(4) In addition to the facts stated in answer (2), I would only point out that I left the U.S. over two years before I received any induction notices, and I never had advance knowledge of these notices.

I was then notified by the Home Office that they were consulting with the U.S. Embassy on this matter. The Home Office did not request any information from me. In March, 1954, the Home Office informed me that if my citizenship were revoked they would cancel my permit to stay, and that they would not renew it under this circumstance in June, 1954.

The Home Office was approached by the Vice-Chancellor of the University of Birmingham, by Professor A. V. Hill, F.R.S., and by A. Wedgwood Benn, M.P., who supported my request to be allowed to remain in the U.K. Mr. Benn stated that he considered that I should be granted political asylum.

The Home Secretary replied that:

(1) It would be a dangerous precedent to allow me to remain here.
(2) Political asylum is only considered when life is endangered.
(3) I would not be allowed to remain here after June 30.

The penalties that I face, apart from lack of employment, if forced to return to the U.S., are loss of citizenship and 5–10 years in prison.

My own wish is to settle down quietly in the U.K., and to continue my scientific work. I firmly believe that my legal and moral position is quite justified and clear.

Up till last Tuesday neither the Home Office nor the United States Embassy had commented in detail on Dr. Cort's case; but the Embassy described the statutory obligation of U.S. nationals liable to National Service to obtain a permit from their selective service board before leaving the U.S.A., and, if they remained long abroad, to report for medical examination or induction when so required. Dr. Cort declared (*Manchester Guardian*, June 15) that he was cleared by his local draft board when he left the U.S.A. in May, 1951; it was only after his name had been mentioned in investigating committee hearings that he had refused to return for enlistment.

BIRTHDAY HONOURS

The list of honours published on June 10 contains the names of the following members of the medical profession:

Baronet

Sir RUSSELL BRAIN, D.M. Oxfd, LL.D.
President of the Royal College of Physicians of London; physician to the London Hospital.

C.H.

WILLIAM SOMERSET MAUGHAM, D.LITT. Oxfd, M.R.C.S.
Author and dramatist.

Knights Bachelor

RUSSELL CLAUDE BROCK, M.S. Lond., F.R.C.S.
Surgeon, Guy's Hospital and Brompton Hospital, London.

ALEXANDER PATERSON MURPHY, M.C., M.D. Sydney, F.R.C.P.
President of the Royal Australasian College of Physicians.

HERBERT HENRY SCHLINK, M.B. Sydney, F.R.A.C.S., F.R.C.O.G.
Consulting gynæcological surgeon, Royal Prince Alfred Hospital, Sydney.

C.B. (Military)

Major-General WILLIAM ALEXANDER DUNCAN DRUMMOND, C.B.E., F.R.C.S.

Major-General RICHARD MURPHY, C.B.E., M.B. Dubl., Q.H.S.

C.M.G.

ROBERT SAMUEL FLEMING HENNESSEY, M.D. Dubl., F.R.C.P.I.
Director of medical services, Uganda.

ANDREW TOPPING, T.D., M.A., M.D. Aberd., F.R.C.P.
Dean, London School of Hygiene and Tropical Medicine.

C.B.E. (Civil)

CHETWYND JOHN PERSHALL GROSVENOR, M.A., M.B. Camb.
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Public Health

Q FEVER IN GREAT BRITAIN
SHEEP AS A SOURCE OF INFECTION FOR MAN *

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A PREVIOUS report (Marmion et al. 1953) described some aspects of the epidemiology of human cases of Q fever in Great Britain but drew no final conclusions about the animal sources of infection in this country.

Attention was drawn to the larger number of clinical cases of Q fever which had been detected in Kent compared with several counties in East Anglia (see table I). Tests of sera from healthy blood-donors living in these two areas also suggested an uneven distribution of infection, because complement-fixing antibodies for *Rickettsia burneti* were found in 3·29% of Kentish donors compared with 0·8% of those in the eastern counties. Although the factors causing this uneven prevalence of human infection are not yet clear, it is felt that differences in the numbers and species of domestic animals available as sources of human infection in the two areas might be partly responsible.

TABLE I—Q FEVER AND STOCKING IN DIFFERENT COUNTIES

County	Human population per sq. mile		Animals per 100 acres of crops and grass			% of herds of cows infected†	% of blood-donors serologically infected‡	Clinical cases of Q fever 1949–51
	Total	Rural*	Cattle	Sheep	Pigs			
Kent	990	678	19·7	65·9	10·9	8·2	3·29	72
Norfolk, Suffolk, Cambridgeshire, Isle of Ely, and Huntingdonshire	266	205	15·4	6·1	12·6	0·24	0·8	0

* Population per square mile, excluding towns with more than 50,000 inhabitants.
† Herd-milk samples containing *R. burneti* demonstrable by guineapig inoculation.
‡ Percentage of blood-donors' sera which contained complement-fixing antibody at a titre of 1/10 or above (Henzerling antigen 1950–51 survey).

Table I shows that the density of stocking with cattle in the two areas is about the same: 15–19 cows per 100 acres of crops and grass. Infection with *R. burneti* appears to be commoner in Kentish cattle, judged by tests of herd-milk samples: 8·2% positive in Kent against 0·24% in the eastern counties. This difference may contribute to the relative prevalences of Q fever in man in the two areas. However, apart from infection in the cattle, the areas differ strikingly in numbers of sheep (table I).

* This work was done from the Department of Pathology, Tennis Court Road, Cambridge, as part of an investigation of Q fever in Great Britain supported jointly by the Medical Research Council and the University of Cambridge.
† Seconded for the purpose of this investigation.

That infection of sheep with *R. burneti* takes place in Nature was shown by Caminopetros (1948), who isolated the organism from the milk of sheep in Greece. Infected sheep have also been found in North California (Lennette et al. 1949), in Italy (Baldelli 1950, Caporale 1950), and in Portugal (Fonseca et al. 1951). The results of epidemiological investigations in all these places suggest that sheep can be responsible for human infection.

If in Kent sheep were infected, as well as cattle, this would be an additional explanation for the prevalence of the disease in that county. For this reason Kentish sheep were investigated, and in a certain area of Kent with particularly large numbers of sheep infection in both human beings and sheep has been found. This finding introduces a new element into the epidemiology of Q fever in Great Britain.

Methods

CHOICE OF AREA FOR INVESTIGATION

In many parts of Kent cattle and sheep are found together in the same areas in numbers which complicate identification of one or other animal as a source of human infection. Because of this it was decided to search for human cases of Q fever and infected sheep in Romney Marsh. This is well known as a traditional place for the breeding and fattening of sheep, and its pastures carry a very large number, particularly during the summer. Romney Marsh is a small area about 31,000 acres (48·4 sq. miles). The number of sheep is large (about 287 per 100 acres of crops and grass) compared with the number of cattle (10 per 100 acres of crops and grass). The human population of the Marsh is sparse (9247) and mostly found in the towns of Lydd, New Romney, Greatstone, Littlestone, and Dymchurch. Except in 1 person who lived at Lydd, no cases of Q fever had been recognised in the area during the earlier investigation from 1949 to 1951.

DETECTION OF Q FEVER IN MAN

Two methods were used. First, a list of persons notified to the medical officer of health as having had "pneumonia" "primary pneumonia," or "influenzal pneumonia" in 1949–53 was obtained through the kindness of Dr. J. Marshall, M.O.H. for the area. Secondly, with the help of the medical practitioners in the area, a number of persons who had had a febrile illness in 1949–53 but had not been notified as having "pneumonia," were collected. These two groups of patients, with the exception of children aged less than 10 years, were then visited, their coöperation was sought, and a sample of their blood was tested for complement-fixing antibody to *R. burneti* (Nine Mile strain antigen). Those persons who both had had a clinically suggestive illness and had a complement-fixing antibody titre of 1/40 or more were considered to have been cases of Q fever and were investigated epidemiologically. Serological tests of healthy volunteers among inhabitants of the Marsh were also made to provide both a standard against which the serological results of the patients could be interpreted and an indication of the degree of exposure of Marsh residents to *R. burneti*.

INVESTIGATION OF SHEEP IN KENT AND ROMNEY MARSH

At the beginning of the investigation, when it was still uncertain whether sheep in Kent were infected at all, specimens of blood were collected as animals were slaughtered at various Ministry of Food abattoirs in Kent. These sheep had been kept in various parts of Kent but were of differing age, sex, and breeding history. After the detection of human cases of Q fever in Romney Marsh and when the epidemiological investigation implicated sheep, particular flocks of these animals were examined. 5–10 ml. of blood was collected from the jugular vein of the ewes. The sera from these blood samples were tested for complement-fixing antibodies to *R. burneti*. The complement-fixation test using the Nine Mile strain of *R. burneti* as antigen was applied at first, and later many sera were retested with Henzerling strain antigen because this was found to be more satisfactory with sera from Kentish sheep. A suspension of murine-typhus rickettsiæ was used as a control antigen in all the tests, and only those sera which reacted with *R. burneti* and did not react with this antigen were considered to contain specific antibody.

Further investigations are being made in Romney Marsh to find out more about clinical and subclinical infections in man and their relation to infection among sheep and cattle. Corresponding investigations, as a control, are also being made in a geographically similar area of the Fenlands near Cambridge, which has a human and cattle population resembling that of Romney Marsh but differs considerably from it in its numbers of sheep.

Results

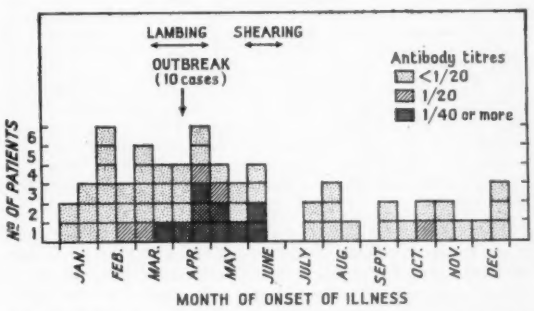
Q FEVER IN MAN IN ROMNEY MARSH

From February, 1949, to August, 1953, 90 persons were notified as having "pneumonia." This represents a "pneumonia-rate" of about 2·4 per 1000 of the population per year. Of these 90 persons 27 were children aged less than 10 years, who have not yet been investigated. 38 of the remaining 63 patients notified as having "pneumonia," &c., and 24 persons who had had unexplained febrile illness according to medical practitioners' records, making a total of 62, have been tested serologically. Of this group 10 (16%) have provided complement-fixing antibodies to *R. burneti* at a titre of 1/40 or greater. Sera from 17 persons in the group gave lower complement-fixing antibody titres from 1/5 to 1/20, and 35 were negative at $< 1/5$ (table II).

TABLE II—FREQUENCY DISTRIBUTION OF TITRES OF COMPLEMENT-FIXING ANTIBODIES TO *R. burneti* IN SERA OF SICK AND HEALTHY PERSONS IN ROMNEY MARSH

Group investigated	Number of persons with complement-fixing antibodies to *R. burneti* at titres of							
	< 5	5	10	20	40	80	160	Total
"Pneumonia" or febrile illness	35	7	5	5	1	3	6	62
Controls (see text) ..	76	8	14	1	1	0	0	100

It is important to know how often complement-fixing antibody at a titre of 1/40 or above would be found in healthy persons living in the Marsh, because there might be merely a chance association between the occurrence of illness and the presence of antibody in any particular person with pneumonia or fever. Examination of sera from 100 healthy controls showed that, though complement-fixing antibody is commonly found in Marsh inhabitants (16% of sera reacted at a titre of 1/10 or greater), levels of 1/40 or greater were more often found in the sera of "pneumonia" and "fever" patients (16%) than in those of the controls (1%) (table II) ($\chi^2 = 11{\cdot}5$; $p = < 0{\cdot}001$). Our supposition, therefore, that persons with antibody at titres of 1/40 or greater who had had clinically suggestive illness had probably had Q fever is not unreasonable. Accordingly, for



Relationship between antibody levels to *R. burneti* in patients with "pneumonia" or with pyrexia of obscure origin and time of year of onset of illness. Times of lambing and shearing are also shown.

convenience, these persons are referred to below as patients who had had Q fever.

The accompanying figure shows the titres of antibody in the sera of the "pneumonia" and "fever" patients in relation to the month of the year when their illness began. It can be seen that the 10 patients with complement-fixing antibody at titres of 1/40 or over—the patients who had had Q fever—began their illness during the period from the second half of March to the first half of June. This is the period of the year when there is much activity with the sheep on the farms, including lambing (March and April) and shearing (June). In addition to these 10 sporadic cases, an outbreak of 10 cases of Q fever was identified in retrospect among the cast of a religious play held at a small village in the central part of the Marsh. This happened during the lambing period (see figure).

Q FEVER IN KENTISH SHEEP AND ITS RELATION TO HUMAN INFECTION

Serological Infection-rates in Kentish Sheep

906 sera from sheep killed in Kent slaughter-houses were examined for complement-fixing antibodies, the Nine Mile strain of *R. burneti* being used as antigen. 15 (1·6%) had antibody titres of 1/10 or greater.

Epidemiological Investigation of Human Q Fever and Sheep in Romney Marsh

Five flocks of sheep associated with three groups of Q-fever patients were examined.

Flock 1 was on a large farm where two agricultural workers had had Q fever in March and April, 1952.

Flocks 2, 3, and 4 were pastured on various sides of the village where the outbreak of Q fever had occurred in April, 1949, and there was subsequently another case, Mr. A, in 1952. Flock 3 is of special interest because it had lambed in a field at the back of the row of houses where Mr. A lived.

Flock 5 is likewise of special interest, because it was associated with a patient who developed Q fever during the investigation—a fact which enabled a current, rather than retrospective, investigation of a flock to be be made. For this reason the episode is described in more detail:

Mr. B, aged 26, who had not previously worked on the land, left the Royal Navy in September, 1952. In October, 1952, he was engaged as shepherd for flock 5. He was in good health until April 27, 1953, when he felt listless and alternately hot and cold. Next day he developed a severe headache and pains in the limbs, profuse sweating, and pyrexia (101°–102°F). He was ill for about a week in all. Tests of specimens of serum taken on the fourth and twentieth days of illness showed complement-fixing antibody titres of < 1/5 and 1/160 to *R. burneti*. A mild attack of Q fever was diagnosed.

The sheep in flock 5 are pastured on an isolated farm, where there are no cattle, goats, or pigs. Mr. B had not had contact with cattle, sheep, goats, or pigs on other farms at the time (April 4–14) when he probably acquired his infection. Lambing started in flock 5 on March 28 and was most frequent during the first week of April, about twenty days before the onset of Mr. B's illness. During the lambing period Mr. B was naturally much occupied with the delivery of the ewes and care of the lambs. Mr. B used in his household raw milk from a local dairy. Milk supplied by this dairy was tested and did not contain *R. burneti* demonstrable by guineapig inoculation. The herd of cattle from which it had come did not give serological evidence of infection with the organism.

From table III it can be seen that 7·7% of the sera from sheep in flock 5 had complement-fixing antibody at titres of 1/10 or above when tested with Henzerling-strain antigen. The facts that this flock was infected; that it had lambed at a time (about twenty days before the onset of illness) when Mr. B must have acquired his infection; that Mr. B was not exposed to other possible sources of infection, such as parturient cattle or goats, or infected milk from these animals, are all in accord with the view that he was infected from his sheep.

TABLE III—RESULTS OF TESTING SERA FROM SHEEP FOR COMPLEMENT-FIXING ANTIBODY TO HENZERLING STRAIN OF *R. burneti*

Source	No. tested	Distribution of antibody titres					% positive at 1/10 or over
		<10	10	20	40	80	
Ewes:							
Flock 1*	92	88	2	1	1	..	4·3
Flock 2	88	86	1	..	1	..	2·3
Flock 3*	95	63	12	10	6	4	33·7
Flock 4	64	63	..	1	..	..	1·6
Flock 5*	143	132	5	4	1	1	7·7

* Flocks associated with a case or cases of human Q fever.

Similarly, serological evidence of infection was found in flocks 1 and 3 associated with the other cases of Q fever. In flock 3 the high figure of 33·7% positive was obtained. This figure was considerably higher than that observed among ewes in flocks 2 and 4, which were rather more distant from Mr. A's house (table III).

Discussion

The epidemiology of human Q fever due to infection from sheep has a suggestive pattern, of which one feature is the limited seasonal incidence of cases. Thus in North California human Q fever is commonest from February to May (Clark et al. 1951), the months just after lambing and when sheep are being castrated, "docked," shorn, and generally much handled and moved. The epidemiological importance of parturition in sheep and the period immediately following it has been emphasised by several observers (Lennette 1950, Caporale 1950). *R. burneti* has been found in large numbers in the placenta (Welsh et al. 1951), birth fluids (Abinanti et al. 1953), and fæces (Winn et al. 1953) of parturient sheep. It is also excreted in the milk (Caminopetros 1948, Lennette et al. 1949) after parturition, but this is probably of less epidemiological significance than parturition as such, except perhaps in countries where sheep's milk is widely drunk or made into cheese.

This sudden and intense excretion of rickettsiæ at parturition, together with the increased farming activity and, perhaps, meteorological conditions favouring dissemination in dust, lead to a sharp seasonal prevalence of human Q fever.

Some features of the pattern have been found in the Romney Marsh. Q fever appears to be fairly common in the inhabitants of the area. About 16% of a group of patients who had had pneumonia or obscure fever had serological evidence of infection with *R. burneti*, suggesting that they had had Q fever. Subclinical infection of the Marsh inhabitants also appears to be common, because a similar percentage (16%) of healthy persons tested had antibody but at lower titres than the patients who had probably had Q fever. Serological examination of sheep in the Marsh shows them to be infected, and there is suggestive evidence that this infection is responsible for that of human beings in the area. Thus, infected sheep have been found in the vicinity of human cases of Q fever—e.g., in the incident of Mr. B and his flock—and the onsets of illness in the patients with Q fever are closely grouped in time and related to lambing and shearing (see figure).

The possibility that some other domestic animal is the primary source of Q fever in the Marsh is being further explored. There are only a few pigs and an occasional goat in the area; so cattle seem to offer the only likely alternative to sheep as a source of infection. It is improbable, however, that cattle are commonly the source of the human infections. If the birth of young,

with its attendant dissemination of rickettsiæ, is directly or indirectly the occasion of human infection, the number of births in either cattle or sheep during the relevant period will determine the importance of the species as a source of human infection, provided that infection-rates in the two species are not grossly disproportionate, and that parturition takes place in similar environments. In the Marsh from March to June, in which season the human cases of Q fever occurred, about 20,000 lambs and 300 calves are usually born. There is no evidence that cattle in the area are commonly infected; hence the sheep seem to be the more important on this numerical basis. In addition to this, from July to February about 400–500 calves were born, but no cases of Q fever were detected (see figure).

Lastly, dissemination of infection from cattle by their milk, which would give an effect out of proportion to their numbers, also would not completely explain the findings. Consumption of an infected milk-supply would account for the infection of only 3 of the 10 sporadic cases and is unlikely to have been the cause of the outbreak of 10 cases.

In the studies of sheep as a source of human Q fever in North California Lennette et al. (1949, 1951) have pointed out that a greater proportion of serologically positive sheep are usually found in flocks associated with cases of Q fever than in those coming to slaughter at abattoirs. It is indeed reasonable to expect such differences between flocks in which infection is active and, where as a consequence, there would be a greater probability of man being infected, compared with a sample of the sheep population at large.

In the present investigation serological infection-rates in sheep in flocks 1, 3, and 5 were from three to five times as high as in sheep at Kentish slaughter-houses. (All the sera were tested with the same—Nine Mile—antigen.)

However, the validity of such comparisons needs further assessment, for they must be influenced in addition, and to an unknown extent, by differences in the age, sex, breeding-experience, and time of testing of the two populations which are being compared.

The levels of complement-fixing antibody to *R. burneti* found in the sera of sheep we have tested were mostly low (table III), but the finding of some sera with antibody at titres of 1/40–1/80 in the absence of reaction with the control murine-typhus antigen is considered to be a demonstration of specific antibody and evidence of infection of the sheep with *R. burneti*.

The fact that sheep in Kent are both numerically common and infected may, as already stated, go some way to explaining the frequency of human clinical and subclinical infection in this county. Infection of man from sheep does not appear to provide the entire explanation, however, because at least 35% of our original series of sporadic cases of Q fever in Kent as a whole, in contrast to Romney Marsh, occurred at times of the year or in circumstances where infection from sheep was unlikely.

Summary

Tests of sheep in Kent have shown them to have serological evidence of infection with *R. burneti*.

Investigation of a small area of Kent heavily stocked with sheep has shown that clinical and subclinical Q fever is common in the community and that sheep give serological evidence of infection.

Some evidence is presented that infection of sheep is responsible for infection of man in this area.

We are indebted to general practitioners in the Romney Marsh area for information about and permission to visit their patients. Dr. P. M. Vicary and Dr. E. Leiser Lonbay gave much-appreciated help with bleeding of patients, and in addition Dr. Vicary undertook the bleeding of the healthy volunteers. Dr. J. Marshall, M.O.H. for the area, and his staff have helped us with local information and advice. We are grateful to the Ministry of Food and the slaughter-house managers at Ashford, Canterbury, Hythe, Ramsgate, Rochester, Sandwich, Sittingbourne, and Woolwich for collecting specimens of blood from sheep. Mr. A. J. Beeson, the divisional veterinary officer, advised us on the investigation of animals in the field, and his staff, in particular Miss M. J. B. Wheatley, helped us to bleed the sheep and cattle. We received valuable information about agricultural statistics from Mr. R. Duncan and Mr. T. Kimmins of the Agricultural Executive Committee, Maidstone. Lastly, we are grateful to the various farmers in the Marsh who gave us unstinted help during the bleeding of their sheep, and to Miss F. M. Callaby, Miss Z. E. Page, and Mr. P. C. Collings who did the laboratory work.

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General Practitioner and Health Visitor

Dr. J. F. Warin, medical officer of health for Oxford, in his annual report for 1953 remarks that lack of correspondence between the districts covered by individual general practitioners and health visitors had made it difficult to organise liaison between them. He met the general practitioners in groups, and thereafter each was allocated a health visitor who worked in his area. The object of this arrangement was to enable every practitioner to know personally a health visitor whom he could approach for help with any problem in his practice. It is too soon, says Dr. Warin, to comment on the result of this arrangement; but a closer understanding between family doctor and health visitor is already apparent.

Dr. Warin remarks on the excellent liaison between the staff responsible for the care of the mother in the lying-in period and the health visitor, who receives a written report on the mother's discharge from the care of hospital or midwife. One of the health visitors goes every week to the lying-in ward of each of the maternity departments, and wherever possible domiciliary midwife and health visitor meet in the mother's house. Health visitors also attend pædiatric sessions at local hospitals.

Epidemiology of Poliomyelitis

In his annual report for 1952, Dr. J. Stevenson Logan, medical officer of health for Southend-on-Sea, describes a serious outbreak of poliomyelitis which began in June of that year and continued for twenty-seven weeks, involving 98 cases—41 paralytic and 57 non-paralytic. The lack of an admission unit at the infectious-diseases hospital makes it necessary for patients to be visited, before removal to hospital, either by the hospital superintendent or by a doctor from the public-health department. Thus general practitioners in the area have become accustomed to notifying suspected cases promptly; and the information about the poliomyelitis cases is unusually complete—with 1 exception the diagnosis of the non-paralytic cases rested on changes in the cerebrospinal fluid.

In investigations of the chains of contacts one striking feature was the frequency with which school-teachers were encountered; but there was no proof that the teachers' households were unusually prone to infection. The families of medical practitioners entirely escaped the disease.

In England Now

A Running Commentary by Peripatetic Correspondents

As a morbid anatomist, I have acquired a certain degree of occupational anosmia, but even my experienced hippocampus reacted to my fellow passenger. I took a sidelong glance; she was an old woman with the face of starvation, the bright and abstracted eye of lunacy, and a tangle of grey and filthy hair. She was surrounded, rather than clad, by a series of ancient garments, culminating in an incredibly patched coat, gaping at the shoulders, with many pins (non-safety) trying in vain to bring the edges of the rents together. On her knees was an old string-bag and some newspaper wrapped round a single shoe. Here at least, I thought, was unusual company, dilapidation of a Dickensian extravagance.

The porteress on the platform screamed: "Mind the doors!" The doors closed. As the train moved off, my companion turned to me and observed, in the accent and intonation of a university drawing-room, "These station women have such raucous voices, haven't they?" Startled into incoherence, I could only mumble "Yes" and await further revelations. But the oracle had spoken, and finally. She mused contentedly over her pronouncement for a few minutes, then took out her false teeth, laid them carefully on her lap with the shoes and string bag, and went to sleep. I felt rather guilty when I had to waken her to let me get out at my destination, but she was very affable.

What a life-saving drug our snobbery can be—surely not a sin or a virtue, but a great gift from a kindly Heaven.

* * *

The art of reading in a bath, according to 'Q,' is rarely attained, but my great toe has now been trained to turn the hot and cold on and off. Reprints are excellent material; or, if I am already saturated with medical matters, an *Everyman* edition is well supported; and what better than *The Diary of Samuel Pepys*. But even he sets me thinking about medical matters when he writes of the plague. In those days all seemed to be attributed to it. On April 8, 1666 (Lord's Day):

"The Court full this morning of the news of Tom Cheffin's death, the King's closet-keeper. He was as well last night as ever, playing at tables in the house, and not very ill this morning at six o'clock, yet dead before seven; they think, of an imposthume in his breast. But it looks fearfully among people now-a-days, the plague, as we hear, encreasing every where again."

I fell to wondering whether a modern coroner might not bring in a different verdict, and so to bed.

* * *

In my own neighbourhood my people still refer to me as "the doctor," and, despite increasing years, in my own mind I am still active, alert, and quite a young man. But the other day on holiday in a remote village where I was a complete stranger, and not the well-accepted figure lately retired from a busy practice, I popped into the local for a glass of beer. Apart from the landlord, behind the bar, there was only another man in the room—an ancient, dilapidated fellow with unshaven red cheeks and watery eyes. A real old chronic, I thought, and nothing much to talk to.

"Good morning," I said, embracing them both in my cheery salutation.

"Good morning, Sir," said the landlord.

"Good morning, Dad," said the ancient.

Dad! Dad! Dad! The word had a sinister ring about it, coming from such a source. "Good gracious," I thought "am I as old-looking as all that?" I felt hurt; the beer didn't taste at all good; there was something undoubtedly wrong—even with having a holiday. Out in the sunshine, however, I reflected how often I had myself told people to remember they were getting older and that they should "ease up." Had I perhaps unwittingly hurt them, just as the old man in the pub had hurt me?

"Dad," he had said. Oh, yes, I would remember. I would remember that, just as ageing is usually a gradual, slow-moving, gentle process, so giving advice about it should be tempered with great kindliness, patient understanding, and quiet dignity.

* * *

There is no rest-house in the little village where I spent Easter, and I slept under a tree not far from the chief's compound. They warned me that the sheep and goats were not locked up at night and that I might be visited, so before retiring I made a pile of stones convenient to the hand beside my camp bed.

I was indeed visited, and after several misses one stone got home with a satisfying thud—followed by an extraordinary noise, like a mad trombone moaning to the wild west wind. Investigation showed that a goat had put its head right into the large earthenware waterpot provided for me by the chief. In its confusion after being caught in the short ribs by a stone it was waltzing dizzily, partnered by the pot, with its chin and horns impacted at the brim.

A spinal application proved ineffective, and was an ill-judged procedure, especially as the operator was of course wearing only light bedroom slippers. However, manual version without anæsthetic was fairly easy, though when the goat's head was (necessarily) pushed under water the trombone noise gave place temporarily to that of a French horn that has been turned over and over too few times. The pot was unhurt, and the goat showed no sign of birth palsy as it decamped; quite the reverse, I never saw a less spastic goat. Bannister himself would have had difficulty in following up the case.

* * *

How lucky we were to have our firstborn in the spring! Lovely, sunny days for drying the nappies and for putting baby out in the garden in her pretty little frocks. It must be so difficult in the winter with a house full of damp washing and waking up in the bitter chill of night to feed her. So many are the disadvantages of winter births that I am surprised that humans, like other more sensible mammals and birds, have not developed a breeding season confined to the spring and summer months. Of course obstetrics would then be a seasonal occupation with a mad rush in the summer followed by unemployment in the winter. The obvious answer would be to practise obstetrics in the spring and summer and pædiatrics in the autumn and winter when all last year's production would be getting their coughs and colds. By the time that the last whoops were dying away the first cries of the new crop of babies would be heard in the land. The Royal College could offer a cup for the first delivery of the season.

* * *

Unsatisfied, perhaps, with my efforts, the editorial board of the *Ruritanian Journal of Abstracts* has sent me a list of abbreviations. Most of them are plain sailing. I am happily familiar with ml, ecg, i.v., and many others; i.r. (infra-red) nearly sent me to a dictionary until I realised that a hyphen was missing. But the best is C-R (crown-rump). Please, nobody tell me what crown-rump means. Rump is easy, and the C.O.D. confirms my opinion, but crown . . . Is crown a noun? Hardly, for it is apparently applied to the wrong end. Is crown a verb? If so I might arrive fairly soon at a reasonable conclusion. I shall spend many happy hours puzzling it out.

* * *

I had to go to the hospital last Sunday so I decided to give our small daughter her first glimpse of white corridors. We set off grandly in the old Riley, which has just celebrated her 19th birthday, and luckily arrived in time for coffee on the ward. Afterwards I handed Frederica over to sister children's and set off on my brief round. About forty-five minutes later we were bowling along home looking forward to our roast lunch but in deep silence; the young mind was obviously impressed.

About a week later Frederica and I were discussing the more serious side of life, which included why it wouldn't be a good thing to take out James's appendix with the carving knife even though he is too young to resist, when she suddenly looked up at me and said: "Daddy, when you go to work in the hospital every day, do you stay in bed all the time too?"

Letters to the Editor

THE POSITION OF NEUROLOGY

SIR,—I am grateful to Sir Francis Walshe for his support in the campaign of the Royal College of Physicians for an adequate neurological consultant service, but I should like to carry his diagnosis a little further. I have no doubt that the economic factor he mentions is one reason why sufficient neurological consultants are not being appointed. But how does it operate? The difficulty arises in connection with regional hospital board appointments and not in the teaching hospitals. The reason is that in a teaching hospital the needs of different departments are discussed in an influential medical committee where all are represented, and the resulting recommendations are normally accepted by the board of governors. But regional hospital boards obtain their advice from an S.A.M.O. and a medical committee which is appointed by themselves and is not representative of all the important branches of medicine. How many such committees include a neurologist? Regional neurological committees may exist, but these are ineffective if they are not represented at the centre. Their advice may not be taken or even sought.

I know that the medical committees of regional hospital boards are devoted and hardworking bodies, but I believe that a medical service cannot be effectively planned unless its organisation includes a comprehensive and representative medical committee at regional hospital board level. This lack is one of the major defects of the present system.

London, W.1. W. RUSSELL BRAIN.

THE PLIGHT OF SENIOR REGISTRARS

SIR,—In recent issues of *The Lancet* there have been several letters from registrars about the problems of their group. It is a sad commentary on the present state of affairs that most of the writers should have had to remain anonymous. They must feel that their own positions are so insecure and their future so uncertain that they cannot risk being dubbed as "political agitators." This thought must be influencing many registrars, who, as individuals, are surprisingly unvocal about the disastrous position which still confronts them.

There has been a comparative lull in official thought about senior registrars because of the Ministry decision [1] to allow them to re-apply for their own posts and to permit retention of "transitional posts." This does not mean that there has been any real improvement in the situation. If illustration is needed, the case of the Bournemouth obstetrics post can be cited. For this post—recently advertised—there were 108 applicants of less than consultant status. We can reasonably assume that all these applicants have their M.R.C.O.G. When these numbers are set against the 36 posts in obstetrics that have been advertised in the past two years it is clear that the word "disastrous" is not too strong to apply. In some specialties affairs are better arranged, but the over-all situation is just as grave as that in obstetrics.

For several years sporadic attempts have been made, alternately by the Ministry and by the profession, to solve the senior-registrar problem. The measures so far taken have been only of a temporary nature, but as they have avoided the large-scale dismissal of senior registrars they have been acceptable to regional boards, consultants, and registrars alike. The junior staffing of hospitals is now suffering, partly because young doctors see the mess that their predecessors are in, and will not commit themselves to a similar uncertain future. This is the moment for the Ministry and the profession to agree on a solution to the senior-registrar problem which will at one stroke set right the wrongs of the present generation and prevent any recurrence of the muddle.

To understand the present position it is necessary to recall briefly some historical points:

1. Towards the end of the war some senior members of the Royal colleges recalled their own struggles after the 1914–18 war. A willing Ministry of Labour was persuaded to give ex-Service grants; the Ministry of Health encouraged the training of large numbers of specialists; willing consultants took on extra staff, and the positions later designated as senior registrar and registrar were rapidly filled.

2. In 1950 the Ministry saw the troubles ahead and attempted to halve the number of senior registrars. The method of doing this and the lack of alternative plans for doing their work caused a political storm and the rejection of the scheme. In its object, however, it was sound.

3. The problem was discussed between the Ministry and the Joint Consultants' Committee, and in 1951 a revised establishment of 960 senior registrars was agreed.[2] In accepting this figure the Ministry, the consultants, and the registrars made a fundamental mistake. This large number was agreed because it seemed necessary to provide a certain amount of competition for each available consultant post. In addition, the senior registrar was regarded as essential to the working of the hospitals. Here I must quote the words of the joint committee on this subject: "In view of the fact that the senior registrar is a key member of the medical staff . . . the number of posts should not be related too closely to the number of possible openings for consultants, and besides being related to hospital needs they should allow for a proper measure of competition on the Senior Registrar/Consultant level." [3] It was estimated that approximately 150 permanent specialists' posts would be available each year, and it was therefore reasonable that something over 200 doctors should be available to compete for them ("the annual outflow"). In theory, the surplus of unlucky senior registrars then disappeared and the following year a new batch, again over 200 strong, were available for the next 150 posts; and so the thing was to go on year after year. In reality, at any given moment and for any given post there are competitors from senior registrars in their 3rd, 4th, and subsequent years, from research-workers, from S.H.M.O.s, and from university lecturers. This false concept of the numbers needed to provide competition has led directly to the present state of affairs. It is now clear that even if the 960 senior registrars were the only competitors there would be far too many to provide fair competition. This is the main error that must be corrected.

Before proposing a solution we must examine the work being done today by senior registrars. No-one can deny that in many cases this is of consultant nature; often the senior registrar has complete control of beds in all but name. It is obvious that a numerically inadequate specialist service is being supported by a grossly exaggerated body of senior registrars. The only possible excuse for getting this work done by men of less than consultant status is to say that they are "training"; but, in fact, we now know that they are training for non-existent positions. This employment of senior registrars in excess of training needs is the main source of cheap specialist labour in the hospital service.

Quite apart from the intense personal problems of the present senior registrars it is essential to the future of the hospital service that this anomaly should be removed. The actions needed are these:

1. The real training needs should be re-assessed in the light of the "competition" fallacy exposed above. The coöperation of the universities should be sought in arriving at a reasonable figure.

2. All positions surplus to the real training needs should be re-assessed. It will be found that the majority of these should be consultant posts. They should be reorganised and re-advertised as such. It might well be acceptable if most of them were made full-time posts with an option of transfer to part-time work after a stated period.

This proper balance between senior registrars and consultants must be such that any man who in future

1. *Brit. med. J.* suppl. 1953, i, 243.

2. *Ibid*, suppl. 1951, ii, 47.
3. *Ibid*, suppl. 1951, i, 24.

becomes a senior registrar can be reasonably certain of getting a consultant post within the foreseeable future. The real selection of future consultants must take place at the registrar/senior-registrar level.

The present crisis in hospital junior staffing provides for the first time a separate and vigorous stimulus for solving the senior-registrar problem. Registrars and consultants alike must hope that reason will prevail and swift action follow.

R. M. FORRESTER
Chairman, Manchester Regional Registrars' Group.

St. Mary's Hospital for Women and Children, Manchester.

SIR,—My problem is that of a very large number of senior medical and surgical registrars throughout the country. Many of us qualified before September, 1939; we saw the war start and we saw it finish; we took off our uniforms and, since specialists were to be needed in the new health service, we sacrificed some further years in acquiring higher medical and surgical degrees; in this we were most kindly aided by Government grants which fed our families and paid some of the rent.

From then onwards we began to emerge with specialist qualifications. We got registrar posts and we climbed to senior-registrar posts; but this, to most of us, now growing middle-aged, has been the end of all progress and hope. We are extraordinarily well qualified, both by examination and experience, for consultant posts, but such posts are fantastically rare and, unless one has acquired a prominent backer or is known personally to a member of a selection committee (I say this with resignation and not rancour), one has, for practical purposes, no chance at all.

I should like to ask two definite questions:

1. Is it intended to do anything about our plight, or are we to be left until despair and financial hardship have successfully reduced our numbers and thus solved the problem?

2. If the answer to (1) is Yes, can something be expected within twelve months? What may this be?

Two explicit answers here would at least salve some of the heartsickness caused by hope deferred for so many years.

Secondly, I have three suggestions to make in the hope that something can be done quickly:

1. Senior-registrar posts should be made permanent, with protection on both sides, so that the registrar and his family can settle without being uprooted every few years.

2. Their pay should be increased, according to qualifications and experience, by annual increment if necessary, so that it more nearly approximates to that of the most junior consultant or that of the general practitioner or any other responsible doctor.

3. Appointments to consultant posts should conform to some recognisable national plan.

SENIOR REGISTRAR.

SIR,—I have only just seen the letter from "Senior Registrar's Wife" (May 8). Unfortunately there is little likelihood that her appeal will register with those who could help, since through long exposure to such *cris de cœur* they have developed an attitude of uneasy laissez-faire. I refer of course to the consultants. It is distressing to have to criticise senior colleagues whom in other respects one holds in esteem, and I should like to excuse in advance the outspokenness of my ensuing remarks on the grounds of desperate urgency.

The present so-called surplus of senior registrars is an isolated phenomenon based on a series of factors so well known as not to need recapitulation, and which we all hope will not recur. The pressure from below has ceased, and it seems likely that the situation will have responded to the law of supply and demand in a few years' time. In the meantime, however, there exists an unfortunate group of some hundreds of senior registrars, many of them excellently trained and qualified, who are unable to find permanent positions. It is difficult to understand, rationally, why this should be so. Can there really be a surplus of senior registrars when most of them are still doing a full day's clinical work? Is it not possible for them to continue to do that work under conditions of security of tenure? In my opinion two factors contribute greatly to the magnitude of the registrar problem.

The first is that too much specialist work, especially in surgery, is still being done by general practitioners.

I know personally of several such instances. I have the highest regard for the G.P. as a G.P., who has a full-time job calling for special skills and knowledge. Few, however, have had adequate surgical training by modern standards, and fewer still work in an environment in which surgical knowledge and technique can be kept at top efficiency. At a time when some hundreds of competent surgeons face professional extinction there can be no place for such surgical dabbling by privileged amateurs. Only the senior consultants, however, could put an end to this abuse. The reasons why they do not do so are obvious to those in contact with the situation, and are not particularly creditable. Most consultants whom I know personally agree in private that G.P. surgery is undesirable, but they are anxious not to offend the often influential men who practise it. The approach employed seems to be the "tactful" one of allowing the G.P. surgeon to die a natural death. Unfortunately we senior registrars face an even more imminent demise.

The second factor is the inertia which obstructs any move to increase the specialist force.

Lack of money is the extremely disingenuous excuse often given. Can anyone believe, however, that the Government, if so urged by the consultants, would balk at the relatively small financial outlay involved in promoting a series of fourth-year senior registrars to part-time consultants? Most hospitals with which I am acquainted could well substitute one or two extra consultants for an equivalent number of senior registrars. Such a move, if applied generally, would virtually solve the registrar problem. Some regional boards, to their everlasting credit, have already taken such steps. Others are lagging, and in our unfortunate position we registrars cannot entirely rid ourselves of the suspicion that the established consultants are influenced in certain cases by a desire to avoid competition in the restricted field of private practice. It would be charitable to assume that this motivation, where it exists, is subconscious.

The ball is with the consultants, many of whom would do well to consider how they themselves might fare, today, if they were applying for their own posts. We senior registrars are not mendicants or misfits. We do not ask for feather-bedding, or for automatic Army-style promotion. All we seek is a fair chance to build our careers.

I dislike unsigned letters, but since my name is at present before committees I would ask your permission, Sir, to remain anonymous.

TRAVELLING FELLOW.

EFFECT OF CONTROLLED HYPOTENSION ON CEREBRAL FUNCTION AND CIRCULATION

SIR,—The elevation of the head in a tilted or upright position reduces the blood-pressure in the brain by 2 mm. Hg for every inch of vertical height above heart level. When vertical, the cerebral blood-pressure in the average adult is approximately 30 mm. Hg lower than at heart level.

In your issue of June 5 Dr. Saunders claims that cerebral function in conscious healthy adults is only slightly impaired when the blood-pressure in the erect posture falls to 60 mm. Hg (presumably measured on the arm at heart level). In two subjects pressures lower than this (45–50 mm. Hg) were apparently without effect on cerebral function. As the cerebral blood-pressure in these subjects must have been in the region of 20–30 mm. Hg during these observations, it is evident that the brain has an enormous safety margin in its vascular supply.

From these figures it is reasonable to assume that the tilted position employed by some anæsthetists for controlled hypotension is reasonably safe, particularly when associated with the decreased cerebral oxygen consumption of anæsthesia.

London, W.1. G. E. HALE ENDERBY.

SYNDROMES OF RHEUMATOID ARTHRITIS

SIR,—Dr. Kersley's article last week is one of the most useful that has appeared in this field for a long time. My clinical experience is in close agreement with his.

I have had a similar proportion of cases which at the outset clinically resembled the classical picture of rheumatic fever more closely than that of rheumatoid arthritis, but eventually developed into typical rheumatoid arthritis. I have not found the therapeutic test of giving salicylates useful, as some of the cases responded well to salicylates at first.

I agree that monarticular cases of rheumatoid arthritis do occur and that the differential diagnosis from tuberculous arthritis is difficult on clinical grounds. The diagnosis is a dangerous one, and should not be made until the chest has been radiographed and a synovial biopsy done; even then the diagnosis should be kept under continuous review. I was recently consulted by a patient who had been attending a rheumatic clinic for some months with so-called monarticular rheumatoid arthritis. At the first consultation a chest radiograph revealed a miliary appearance in the lungs. The patient has since died.

I have also seen several cases of advanced rheumatoid arthritis without pain. Possibly these cases are commoner than Dr. Kersley's experience and my own would lead us to expect, as the patients consult their doctors late in the disease and may pass their lifetime without attending a hospital clinic. Two of my cases were seen in domiciliary practice, for other general medical causes, on their death-beds. Although I agree with Dr. Kersley's general impressions of these fascinating cases, I cannot agree with his argument that because two cases developed pain late in the disease therefore any question of the general pain threshold playing a part is ruled out. In the single case reported by Clark [1] the cutaneous pain threshold was measured and found to be greatly elevated. I have not been able to collect enough cases to form a reliable assessment. It would be interesting to hear the experience of others, and especially to hear of any cases in which the general pain threshold has been measured. This is a most fascinating problem both from the point of view of discovering the fundamental mechanism of the phenomenon, and from the point of view that these cases reveal one of the many fallacies in using tenderness as a test for assessing therapy in rheumatoid arthritis unless the general pain threshold is measured at the same time.

Dr. Kersley's article adds to the belief that astute and careful clinical observation still has a large contribution to make in the elucidation of fundamental problems in rheumatism.

Flimwell, near Wadhurst, Sussex. G. E. LOXTON.

SIR,—I have read with interest Dr. Kersley's article and particularly his account of cases with acute onset resembling rheumatic fever.

As a cardiologist I have always held the opinion that true rheumatoid arthritis does not lead to rheumatic endocarditis (mitral or aortic valvular disease). I note that in Dr. Kersley's series of 750 cases of rheumatoid arthritis only 1 developed carditis resembling that of rheumatic fever.

In this case which he describes (case 1) mitral and aortic disease was noted four months after the development of acute rheumatism and pericarditis at the age of 25.

1. Clark, C. J. M. *Ann. rheum. Dis.* 1951, **10**, 105.

Dr. Kersley does not state whether the mitral disease was mitral stenosis. If this was so it is most unlikely that the valvular disease arose from the acute rheumatic infection four months previously, as mitral stenosis usually takes much longer before it becomes manifest—usually two to five years at the earliest. The valvular disease is much more likely to have originated from an old rheumatic endocarditis in childhood. There may be no history of rheumatic infection at that time, and a rheumatic endocarditis often passes unrecognised and unsuspected until valvular disease becomes manifest years or decades later, as is well known. A further attack of acute rheumatism, as in Dr. Kersley's case, will often make it manifest. The commonest age at which rheumatism attacks the heart is from 5 to 15 years and it very rarely does so after 20 years.

Rheumatoid arthritis is a not uncommon disease in young people in the 20–40 age-group, and this is also the age-group when rheumatic endocarditis is likely to become manifest following a rheumatic infection in early life. It would, therefore, be expected that rheumatoid arthritis with endocarditis will be found in some cases, but this does not at all imply that the endocarditis is the result of the rheumatoid arthritis. I quite agree with Dr. Kersley that "rheumatoid arthritis and rheumatic fever are normally quite distinct, being completely different in clinical course, cardiological complications, prognosis, and therapy"; but I do not agree that "occasional border-line cases should make us wary of regarding them as separate entities." I still believe that they are separate entities, though they may co-exist.

Blackpool. MAURICE NEWMAN.

VOMITING AND REGURGITATION DURING ANÆSTHESIA

SIR,—I was very interested in last week's article by Dr. O'Mullane on the foot-down tilt during the induction phase of anæsthesia for the patient who may have a full stomach. This is a technique that I have found very safe and satisfactory, and I would press for its wide adoption as a standard method for this type of case.

The method as described by Morton and Wylie [1] depends for its effectiveness on the prevention of: (1) active vomiting, by the administration of thiopentone and a relaxant; and (2) passive regurgitation, by ensuring that the pharynx is well above the level of the stomach. In my opinion this method is the safest way of inducing anæsthesia in patients with intestinal obstruction or other causes of the full stomach.

In one respect only would I differ from the observations of Dr. O'Mullane—namely, that vomiting may occur after sleep has been induced but before the relaxant has had time to take effect. Thiopentone depresses the central nervous system so rapidly that the patient is carried below the stage of vomiting before it has had time to develop, and provided the airway is kept completely clear there is no danger of aspiration of gastric contents into the hypopharynx.

The traditional method in these cases—namely, nitrous oxide, oxygen, and ether—possesses two main disadvantages: (1) a relatively low oxygen content in the inspired mixture; and (2) a highly irritant vapour which may on occasions, particularly in inexperienced hands, lead to laryngeal spasm. This in turn may cause aspiration of gastric contents into the hypopharynx, usually aggravated by the head-down tilt adopted at such times, and a very vicious circle is initiated. The resultant anoxia may be highly dangerous to an elderly, ill patient with hidden coronary artery disease and a myocardium ill suited to such an insult. Surely it is more rational to ensure that the gastric contents never reach the pharynx than to rely on the natural reflex ability of the cords to prevent foreign material being aspirated into the lungs—a reflex which may in itself be dangerous.

1. Morton, H. J. V., Wylie, W. D. *Anæsthesia*, 1951, **6**, 190.

This method does not absolve the anæsthetist from ensuring as far as possible that the stomach has been emptied through a suitably wide tube, but even with the utmost care some material may remain in the stomach. One important point must be borne in mind when using the method: it is more important than ever that the anæsthetist should be fully aware of the danger of inducing hypotension in the shocked or oligæmic patient by giving too large a dose of thiopentone.

Newcastle General Hospital, Newcastle upon Tyne. P. HEX VENN.

MERIT AWARDS

SIR,—The council of the Regional Hospitals' Consultants and Specialists Association is aware that throughout the country there is considerable disquiet at the manner in which merit awards are distributed. This disquiet is no doubt due in the main to the overt secrecy which enshrouds the subject. Since the early days of the National Health Service there have in many regions been no local consultations and little or nothing is known of how recommendations are made or considered. In many areas local advisory committees have not been further consulted and, indeed, in some cases have been summarily dissolved.

At its meeting on June 3 the council of this association accepted the following resolution put forward by one of its constituent bodies:

"The Council of the Regional Hospitals' Consultants and Specialists Association is of opinion that in the granting of Distinction Awards the Awards Committee should consult local medical opinion, and that this could best be done through small Regional Advisory Panels of Consultants elected by the Consultants in each Region."

45, Lincoln's Inn Fields, London, W.C.2. JOHN SIMONS President.

HYPERTHYROIDISM AND MYASTHENIA GRAVIS

SIR,—In their interesting article (May 8) Dr. Maclean and Dr. Wilson refer to the antagonism between these two disorders where they co-exist. They note that appropriate treatment for the thyrotoxicosis aggravates the myasthenia gravis, whereas in patients with myasthenic symptoms produced by thyrotoxicosis these symptoms are relieved by such treatment.

They suggest that thyrotoxic myasthenia may be due to the rapid destruction or defective production of cholinesterase at the neuromuscular junction, possibly as the result of a high blood-thyroxine content. Elsewhere they make the apparently contradictory suggestion that a high blood-thyroxine level may cause deficient production or too rapid destruction of acetylcholine.

Does the first of these suggestions provide a clue to the phenomena observed? If in thyrotoxicosis acetylcholine is present in excess owing to the absence of adequate amounts of cholinesterase, might not the myasthenia that may supervene in such a case be due to the persistent effects of unhydrolysed acetylcholine producing neuromuscular blocking? Feldberg [1] found that an excess of acetylcholine produced a spread of the depolarisation current from the motor end-plate to adjacent parts of the muscle-fibre. Might the tendency to persistence of acetylcholine, though in less amounts than would produce neuromuscular blocking, account for the fine tremors of the voluntary musculature in thyrotoxicosis?

On this hypothesis the alleviation of symptoms of myasthenia gravis in thyrotoxicosis would be explained by the relatively small amounts of cholinesterase at the nerve-endings sparing the acetylcholine to some extent.

Royal Mental Hospital, Aberdeen. H. C. S. MACLEAN.

1. Feldberg, W. *Brit. med. J.* 1951, i, 967.

PERIPATETIC PRACTITIONERS

SIR,—May I strongly endorse Dr. Forbes's advice (June 5) about the importance of doctors keeping their defence societies and the General Medical Council informed of a change of permanent address?

There is another disadvantage in failing to do so which he does not mention. The Medical Protection Society sometimes hears of impending litigation which may involve a member whose present whereabouts are unknown to us, and delay in establishing contact with him at an early stage may later seriously prejudice his legal position or that of his colleagues as the action matures.

The difficulty in tracing a woman practitioner may be further increased when she does not inform her defence society or the Registrar of the G.M.C. that she has changed her surname as well as her permanent address!

Medical Protection Society, Victory House, Leicester Square, London, W.C.2. ALISTAIR FRENCH Secretary.

MENTAL CARE

SIR,—The articles by Dr. Bickford (May 1) and Dr. Ling (May 29) and your leader (May 29) raise many important issues for the planning of the mental health services. While with enthusiasm and well-directed effort much can be done to improve the situation, neither the well-known and already widely practised methods of rehabilitation so eloquently presented by Dr. Bickford nor the highly successful approach devised by Professor Querido will entirely solve the problems which mental illness presents. One does not want to be pessimistic at this stage, but it is important to realise the limitations imposed by the clinical, social, and cultural complexities inherent in the problems of mental illness. The mental hospitals' deficiencies do not always account for not achieving the desired complete remission of all symptoms. One must agree with Dr. Bickford, however, that most patients with psychiatric disorder show a very high capacity for social rehabilitation and an ability to live with their symptoms. More research is required into the causes of our successes and failures before we can say what results can be expected from this new approach.

Faced with the serious overcrowding, which burdens and often almost paralyses the proper functioning of the mental hospitals, my colleague, Dr. D. H. Bennett, and I paid a visit to Professor Querido and his colleagues in Amsterdam a little while back. We have spent some time and thought on the problems that could arise, for our own mental hospital and the community it serves, with the introduction of such a scheme as that outlined in Dr. Ling's article and your leader.

The Amsterdam scheme was developed and is operated by the local health authority, of which Professor Querido, a psychiatrist, is also the chief medical officer of health. The mental hospital under these circumstances remains without its own outpatients and other aftercare services, and we came to the conclusion that this conception was not entirely satisfactory. We therefore suggest that the scheme will require modifications in this respect. For our population area of 600,000 we should require for such a twenty-four-hour psychiatric service, apart from transport, about six additional psychiatrists and six psychiatric social workers. Even with this increased number of staff, if these were available, the saving not only in the adult mental health field but also in the departments of child care and education would be very considerable.

All this might sound unduly cautious. It is, however, certain that many of the new principles at present under discussion, adapted to this country's needs, will yield promising results. We do not mean to leave your readers

under the impression that no more capital need be spent on the mental hospitals, whose buildings are out of date and whose equipment is inadequate to meet the needs of patients. Without extra staff or resources it has, however, proved possible in our own case, by applying some of the principles of the Amsterdam scheme, to reduce the overcrowding to an extent which encourages us to plead for a fuller and realistic development of preventive and after-care services. Whilst this cannot be offered as a solution to the problem of the cause and cure of mental illness, it would undoubtedly improve the pattern of psychiatric care.

Netherne Hospital, Coulsdon, Surrey. R. K. FREUDENBERG
Physician-superintendent.

PREOPERATIVE ANÆSTHETIC OUTPATIENT CLINIC

SIR,—The interesting article by Dr. Loder and Dr. Richardson (June 5) draws attention once again to a leading advantage of such clinics; the number of surgical beds available is increased by preliminary investigations and treatment in the outpatient department.

Glycosuria can be stabilised, dental sepsis cleaned up, the anæmic patient given a normal hæmoglobin level by simple therapy, and a report obtained from the chest physician on the patient with tuberculosis. A history of angina of effort or coronary occlusion can at least be noted, putting the anæsthetist on his guard, while in non-urgent cases the advice that the operation should be postponed may prevent a catastrophe.

Less important functions of the clinic include the treatment of obesity by low-calorie diet, with frequent supervision and encouragement (or censure of the uncoöperative). I have seldom met a surgeon, and never an anæsthetist, who does not prefer a reasonably thin patient to a fat one. When thyroidectomy is contemplated, we examine the vocal cords by indirect laryngoscopy. It is wise to record the fact that both cords move normally before anæsthesia and operation.

I notice that some hospital authorities are encouraging the formation of these clinics within the existing establishment. This is asking a good deal of the anæsthetists, and seems a little unrealistic. The work, like all outpatient work, is time-consuming and fatiguing, and requires at least one whole session weekly.

In conclusion I should like to re-emphasise the medicolegal responsibility of the anæsthetist to his patient. Thorough pre-anæsthetic investigation and examination gives the anæsthetist an assurance which is most valuable and may be of great importance if anything goes wrong. Sometimes when feeling somewhat paranoid I think of Dr. Johnson:

"It is the fate of those who toil at the lower employments of life to be exposed to censure without hope of praise; to be disgraced by miscarriage or punished for neglect when success would have been without applause, and diligence without reward."

As anæsthetists we should take all reasonable steps to ensure that everything is done to make the anæsthetic and operation as safe as humanly possible.

General Hospital, Southend-on-Sea. J. ALFRED LEE.

SIR,—Dr. Lee is to be congratulated on his foresight and enterprise in initiating in 1949 the idea of an anæsthetic outpatient clinic.[1]

It has been said that a new idea is the most potent antigen known to science, and it is not surprising that as yet relatively few of these clinics are in existence. It was refreshing to read in January, 1952, of the clinic established at St. George's Hospital, London, by Green and Howart,[2] and in your issue of June 5 of the one run by Dr. Loder and Dr. Richardson at the Peterborough Memorial Hospital. This was referred to as a pre-operative clinic; but, having had a similar type of clinic one afternoon a week at the Hull Royal Infirmary for the past three years, I find it is also of value in seeing patients postoperatively, particularly those on whom one has done diagnostic and therapeutic nerve-blocks and those subjected to specialised techniques such as controlled hypotension.

The principle of the anæsthetic outpatient clinic is sound; it can be managed successfully, and I believe one should form an integral part of every anæsthetic department.

The anæsthetist of the future must be not merely a technician but also a physician, and it is already possible to obtain the M.R.C.P.E. with anæsthesia as the special subject and the F.R.C.P.(C.) with emphasis on anæsthesia.

Hull. W. N. ROLLASON.

1. Lee, J. A. *Anæsthesia*, 1949, **4**, 169.
2. Green, R. A., Howart, D. D. C. *Ibid*, 1952, **7**, 40.

SECULAR HUMANISM

SIR,—Dr. Joseph Walker (May 15) seeks to discredit humanism by saying it is incompatible with Christianity, in much the same way that McCarthy has succeeded in discrediting liberalism by insinuating that it is un-American. Just as American liberals must now cast about for another word to describe the man who conceives his own political interest as bound up in that of society as a whole, so will humanists, if Dr. Walker's "smear" sticks, have to find another word for the deliberate rational quest of human welfare. Thus is our language littered with the untouchable corpses of contaminated words, like the mounting waste of material and tools rendered permanently and lethally radioactive in the production of the bombs.

In maintaining that Communist society is a natural outcome of the humanist tradition he confuses the latter with materialism. The deliberate quest of human welfare does not produce cruel systems, such as Russian Communism or the Spanish Inquisition, which arise from the enforcement of a creed ostensibly in the interest of the majority but in reality out of hatred for the minority. Hatred of the bourgeois is disguised as concern for the proletariat, hatred of heretics disguised as concern for their souls.

By using a revered word, Christianity, with which he tells us humanism is incompatible Dr. Walker seeks to darken the meaning of the latter. Unfortunately he does not tell us whether by Christianity he means the teaching of Christ or that of the Church. Humanism in no way conflicts with the former, but it is of necessity secular—i.e., free of the Church—for it hopes to influence Hindus, Moslems, Christians, Jews, in fact humanity. If by Christianity he means the teaching of the Church then he can hardly expect its firm espousal, which he recommends to the West, to be followed with enthusiasm by our brethren in Asia and Africa. Unencumbered with the elaborations of Alexandrian and European theologians, the teachings of Jesus, an individual and incidentally an Asian, stand far greater chance of acceptance.

Humanism preaches the need for universal love and the conquest of hate but it does so through the method and terms of science, partly because science is one of the few products of Western culture which command universal respect. But more important is the fact that science is the method of securing maximum agreement, with its appeal to the evidence of this world rather than to the authority of dead theologians conjecturing about the next.

The Christian Church has had many hundreds of years in which to persuade mankind to accept its doctrines, yet its failure to do so is continually blamed on mankind (a product of God) rather than on the Christian Church (a product of men). It is hardly likely to succeed in the few decades that are left to us to choose between total destruction and a deliberate rational search for agreement

among all men, at present divided by their adherence to man-made religions, philosophies, and nationalities.

The appeal of the Church is waning because of its insistence that man must adapt to its doctrine rather than vice versa, because of the denial of the biological nature and needs of man involved in much of its mythology and ethics, because of its circumvention rather than incorporation of the scientific attitude, and lastly because of its complacency towards the problem of overpopulation—almost as urgent a danger as are the bombs.

Saskatoon, Saskatchewan, Canada. A. G. RICHARDS.

SURGICAL TREATMENT OF ACUTE OSTEITIS IN CHILDHOOD

SIR,—By describing a simple but possibly very useful modification of technique as "abandoning the method so strongly recommended" Professor Trueta suggests (June 5) that I have been disillusioned in my early preference for aspiration of pus in osteomyelitis as opposed to open operation. Far from it: to improve a technique is not to abandon it, and the use of lavage through two (not several) needles may prove to be a way of getting over the main disadvantage of aspiration, the need for frequent repetition in some cases. The results continue to be as good as before, that is to say as good as those reported from Newcastle seven years later.

The demand for an "objective" report of our late results is reasonable enough. So as to avoid any suspicions that our accounts of our cases may be subjective Professor Trueta is hereby given an invitation to join Dr. Bodian and myself in a review of them at any date that suits him.

As to our original argument, those interested in medical polemics will find it rewarding to look up the correspondence.[1] It ended with an unanswered challenge to state in what ways the final results of open operations are better than those of aspiration; it is obvious enough in what ways they are worse.

London, W.1. DENIS BROWNE.

EARTHING ELECTROCARDIOGRAPHS

SIR,—A rising water-main is usually considered the most efficient earth for electrocardiographs that require earthing, but one is not always readily available; in such cases the earth-wire of a three-pin plug is often a satisfactory alternative. It is an advantage to be equipped for using any of the several standard-size plugs and I have found the following arrangement useful:

The earth-pin of a three-pin 2-amp. plug top is fitted with a single wire about 6–8 in. long, the other end of which is fitted with a crocodile clip with screw terminal. This is connected with the earth-wire of the electrocardiograph. The other two pins of the three-pin 2-amp. plug top are fitted with two wires (twin flex) to carry the A.C. supply to the instrument and with a terminal (5-amp. two-pin socket or bayonet cap) that can be connected with the terminal of the A.C. supply wire of the cardiograph. This arrangement makes it possible to use a three-pin 2-amp. plug for providing the A.C. supply and earthing of the instrument.

By adding a 5–2-amp. three-pin adaptor, a 5-amp. three-pin plug can be used, and by the further addition of a 15–5-amp. three-pin adaptor (M.K. standard, protected by a 5-amp. fuse) a 15 amp. three-pin plug can be used.

With this outfit, which can be put together easily and cheaply, one is equipped to use any of the three standard sizes of three-pin plugs (15-amp., 5-amp., 2-amp.) for providing the A.C. supply and the earthing. This arrangement, however, cannot be used with the more recent 13-amp. square plugs, which are fitted in some new houses, but a plug top of these square plugs can easily be fitted with the necessary wires and terminals.

London, W.1. A. SCHOTT.

1. *Brit. med. J.* 1947, 1, 757 et seq.

THE DISABLED

SIR,—In your leader of June 5 you state that the Central Council for the Care of Cripples finds that some employers make up their quota of disabled by engaging people whose disability does not hamper them for the work in hand. Surely it is just this that needs to be done. The more disabled people that are in jobs congenial to both themselves and their employers, the smaller the problem of employing disabled people.

In occupational health it is necessary to achieve a harmony between the individual and his working environment. A deaf man is better suited to work in a boilermakers' shop than one with acute hearing (in this instance the disability is a positive advantage). A person with a history of bronchitis should not be employed in a silica brickworks or as an electric-arc welder but will probably be well suited to assembly work in a toy factory as long as there is no soldering involved. With a little training a blind person is perfectly able to operate a telephone switchboard.

The essence of employing disabled people is to achieve this harmony, and the only way it is likely to be achieved is by studying the problems and applying the results in the factory. In medicine generalisations are never satisfactory, and in the last resort these problems always boil down to the individual case and one or two possible jobs in any particular factory. It should always be remembered that the main function of industry is to produce, and good production results from the intelligent use of men, machinery, and materials. If industry uses disabled men intelligently it adds an important social function to its main purpose.

Dunvant, near Swansea. G. G. MATHEW.

SIR,—In your admirable leading article there is one statement with which I do not find myself in agreement. You say, in the sixth paragraph, "a bank clerk with a gastric ulcer . . . is not disabled and should not count towards the quota."

Why not? Surely the intention of the Act was to safeguard our weaker brethren. Where mechanical aids decimate staffs (as, I am informed, may happen), will not some remote managing director in the city say: "Yes, now we'd better get rid of Jones in the Littletown Branch first, he's lost a fair amount of time in the last few years." And so poor Jones, unprotected, goes and his ulcer increases another few millimetres in diameter. Or perforates.

Again, "the regulations might well be tightened . . ." This is a fair comment, but how is it to be done? Those of us in industry know that registration under the Act does not represent a true picture of the extent of disabilities. We can all think of workers whose justification for registration is slight; we know that the motives which cause a man to register are many and various. But, by and large, the definition of a disabled person is fair, just, and reasonable, and if it be interpreted in the liberal spirit of the Act no injustice will be done.

It seems to me that the more practical approach would be to raise the quota for industry generally or to apply differential quotas. The latter solution may not appeal because of the inevitable controversy and dispute which it would arouse.

Finally, Sir, one of the functions of the industrial medical officer is to fit the disabled worker, where possible, into a job in which his disability is of no account and he can work on equal terms with his fellows. But that does not mean to say that the disabled worker has the same potential mobility as his fit colleagues. Should hard times come again, the mobility of labour is going to be much more important than it has ever been since the far-off days of 1939.

Rotherham. R. McL. ARCHIBALD.

DIET AND CORONARY DISEASE

SIR,—After reading Professor Duguid's riposte to Dr. Leitner and Mr. Daw I turned to the very next page of your June 5 issue to find the photograph of the late Sir James Spence and, opposite, his words: "Techniques have their place in medicine, but they are not medicine."

Surely neither Professor Duguid in his laboratory experiments, nor Dr. Leitner in quoting statistics, presume to do more than stimulate speculation on this subject by "techniques" which in both instances could be used to confound their own deductions.

To a practising clinician coronary disease and atherosclerosis spell ageing—wear and tear of the cardiovascular system: "A man's as old as his arteries." He may be mystified why patients with similar heredity, habits, and environment should present at times vastly different rates of ageing, but he does come to see and know as a clinical fact that cardiovascular wear and tear is associated with the seven fat years rather than the seven lean ones, that the seven fat years do not mean merely increased fat percentage of total calories, but increased percentage of mechanical transport, sedentary occupation, and nervous as opposed to physical exertion. On this broader base-line Dr. Leitner's graph assumes a more clinical flavour.

Likewise it is of remoter significance to know how a certain lesion is laid down or how it can be mimicked in dog or rabbit than to appreciate why such a lesion means myocardial infarction in one and not in another—a problem that Professor Wenckebach's series of 5000 necropsies leaves unanswered.

London, W.1. W. PINNINGTON JENSON.

APPOINTMENTS SYSTEMS

SIR,—Your annotation last week on the "reasonable, practical, and kindly duty of arranging appointments systems for outpatients" maintains that failure to provide such a system is due to lethargy. There are, however, under certain circumstances valid arguments against an appointments system, and as such apply to one of the hospitals in Leeds Group A, I would like to indicate them.

Ideally appointments are the perfect system. In practice when such a system is instituted the consultant decides the maximum number of patients he can see at each session compatible with giving each a really comprehensive examination. Inevitably in some departments this number is less than was seen in the pre-appointment days, and as a result a waiting-list is soon built up and the patient may have to wait several weeks or even months for an outpatient appointment. There are two possible ways of preventing a waiting-list accumulating. More consultants could be appointed, but this does not seem likely to happen in the near future. Alternatively the consultants could see sufficient numbers of patients at each session to clear the list of patients wanting appointments each week. This would lead to a lowering of the standard of work but would be counterbalanced by the patient being seen within a few days.

In Leeds there are two main outpatient departments: the General Infirmary, where an appointments system has been working very efficiently for some years but where, at times in some departments, outpatients may be kept waiting several weeks for an appointment; and the Public Dispensary, which maintains the "open door" system whereby patients are sent up without a previous appointment and seen if possible the same day (occasionally on very big days they may be referred to the next session). Pressure has been brought to bear on the dispensary to adopt an appointments system. Before any action was taken the local medical committee was consulted and was strongly opposed to any appointments system. The general practitioners maintained that for many patients it was much less deleterious to wait an hour or two on a given day in outpatients than to wait several weeks for an appointment before they ever go to the hospital. The patients appreciated this when it was explained to them.

It is obvious that in Leeds we are lucky in having the two systems working side by side. Where a case is not urgent and the general practitioner wants to send him to a special consultant at the infirmary he can have an appointment. On the other hand for none-acute but relatively urgent conditions the patient can go at once to the dispensary, though he may have to wait a bit when he gets there. For subsequent visits appointments are made at both hospitals.

This letter is a plea against generalisations, emanating from a central authority, which, though excellent in theory, may in certain circumstances do the patient more harm than good.

F. F. HELLIER
Chairman of the Medical Advisory Committee, Leeds Group A Hospitals.

ACTION OF ISONIAZID AND ANTIBIOTICS ON NOCARDIA MADURÆ

SIR,—The effect of antibiotics on several human pathogenic fungi has lately been reported.[1 2] We should like to report a study of the effect of antibiotics in vitro, against *Nocardia maduræ* (previously known as *Actinomyces maduræ*), the causative organism of Madura foot, which is prevalent in parts of Southern India. Antibiotics have been used in the treatment of this disease but results have been inconclusive.

In our experiments a strain of *Nocardia maduræ* was grown in Ashby's mannitol broth (medium A) and glucose-peptone broth (medium B),[3] and assay was made by the serial-dilution method. The assay tubes, each containing 10 ml. of the final broth, were incubated at 37°C for up to three weeks, and the activity of the antibiotics was determined from measurements of growth. The results given in table I indicate the potency of different antibiotics in varying

1. Bieberdorf, F. W. Antibiotics and Chemotherapy, 1953, **3**, 513.
2. Waksman, S. A., Romano, A. H., Lechevalier, H., Raubitschek, F. *Bull. World Hlth Org.* 1952, **6**, 163.
3. Ashby, S. F. *J. Agr. Sci.* 1907, **2**, 38.

TABLE I—EFFECT OF DIFFERENT ANTIBIOTICS ON *Nocardia maduræ*

Concentration (µg. per ml.)	Streptomycin		Chloramphenicol		Aureomycin		Penicillin		Actidione		Patulin		Polymyxin		Penicillic acid	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
0	++++	++++	++++	++++	++++	++++	++++	++++	++++	++++	++++	++++	++++	++++	++++	++++
10	+++	+	++++	++++	−	−	++++	++++	++++	+++	++++	+++	+	−	+++	±
25	+	±	+++	++	−	−	++++	++++	++++	+++	+++	++	−	−	++	±
50	−	−	++	±	−	−	++++	++++	++++	++	++	++	−	−	+	−
75	−	−	−	−	−	−	++++	++++	++++	++	++	−	−	−	±	−
100	−	−	−	−	−	−	++++	++++	++++	++	+	−	−	−	−	−

++++ = good growth. +++ = medium. ++ = poor. + = very poor. ± = doubtful. − = no growth.

TABLE II—EFFECT OF ISONICOTINIC ACID HYDRAZIDE AND STREPTOHYDRAZID ON *Nocardia maduræ*

Concentration (mg. per ml.)	Isoniazid		Streptohydrazid	
	A	B	A	B
0	++++	++++	++++	++++
0·25	+++	++++	−	++++
0·50	+	++++	−	++++
1·0	−	++++	−	++++

concentrations against the test organism. All experiments were carried out in triplicate and the mean values recorded.

Isoniazid and streptohydrazid [4] (a condensation product of isoniaziad and streptomycin) were similarly tested, but limiting concentrations were much higher than those used in the case of antibiotics. The same experiments were carried out, and the results are given in table II.

It was shown that streptomycin and aureomycin might be successful in clinical use and that polymyxin is also worth clinical trial. Actidione and patulin, two antifungal agents, had no promising inhibitory action while penicillin, although widely used, had practically no action against test organism. Streptohydrazid was effective in concentrations of 0·25–1·0 mg. per ml. and isoniazid inhibited growth only at concentrations of 0·5–1·0 mg. per ml.

The absence of inhibition by isoniazid and streptohydrazid in medium B, is difficult to explain on the available data, and further work on this point will be reported elsewhere.

Our thanks are due to Dr. A. Chakravorty, of the School of Tropical Medicine, Calcutta, for the strain of *Nocardia maduræ*, and to Messrs. Chas. Pfizer for pure samples of antibiotics.

A. K. BANERJEE
G. P. SEN
P. NANDI.
Microbiological Laboratory, Bose Institute, Calcutta, 9.

ARTHROPLASTY *v.* ARTHRODESIS

SIR,—It is very wrong of Sir Reginald Watson-Jones (June 12) to use such a phrase as "the results [of arthroplasty] can be good if the operation is done well, and most recent failures have arisen not because the operation was bad but because the operation was done badly." Surely he does not really mean thus to insult those of us who have had reason to doubt the efficacy of recent methods of arthroplasty of the hip-joint. The investigations reported by Dr. Margaret Shepherd,[5] are based upon work carried out in half a dozen centres by a number of competent surgeons in 500 cases. The conclusion is that too high a proportion of cases have results which do not stand up long enough to stress of normal character. The operation and after-treatment, which costs the State at least £200 and has only a 50% chance of giving satisfaction for five years, must be regarded with the gravest doubt. It is probable that the results are even worse than my figures suggest. Such would not be tolerated by any general surgeon treating hernia or gastric ulcer.

To say that the bad results of surgery are the results of bad surgery is a half-truth that can be quite untrue. Many surgeons regard gastro-enterostomy as a bad operation even though it has produced some excellent results with a low mortality; but their opinion is not based upon the fact that occasionally the operation was badly done. What right has Sir Reginald to stigmatise the work of his professional brethren, when unsuccessful, as "done badly"? If the result of such criticism should be to prevent other surgeons from allowing an honest inquiry into their results, he will have done surgery a disservice.

NORMAN CAPENER.
Exeter.

4. Pennington, F. C., Guerico, P. A., Solomons, I. A., *J. Amer. Chem. Soc.* 1953, **75**, 2262.
5. See *Lancet*, May 29, 1954, p. 1113.

SURGERY OF THE THYMUS GLAND

SIR,—In his article last week Mr. Geoffrey Keynes refers to some of the evidence for the existence in myasthenia gravis of a circulating curare-like substance, and suggests the thymus gland as a source.

The established neuromuscular block of myasthenia undoubtedly has the properties of a competitive inhibition or curare type of block. Thus, it is reversed by substances having only an antagonism for competitive block in common (e.g., neostigmine, adrenaline, and tetraethylpyrophosphate), it is potentiated by *d*-tubocurarine, and it is greater on higher (tetanic) rates of nerve discharge.

It is, however, a far cry from establishing the presence of a competitive inhibition block in myasthenia to suggesting a circulating curare-like substance of thymic origin as the cause of it, particularly as this would not explain many of the clinical and experimental findings peculiar to myasthenia. For instance, it is difficult to see how the circulating curare-like substance alone could produce weakness confined to isolated peripheral muscles such as occurs in some forms of myasthenia. Further, it can be observed both clinically and electromyographically that myasthenic weakness, unlike that produced by *d*-tubocurarine, is a progressive type of transmission block, requiring a period of exertion to produce it, and reversing on relaxation.[1] In fact, the whole clinical and electromyographic picture is that of a cumulative neuromuscular block dependent on the arrival of nerve impulses and totally unlike the effect of the administration of muscle relaxants of either the competitive inhibition or depolarising type to conscious human subjects.

Similarly, experimental evidence does not support the concept of a circulating curare-like substance as the cause of myasthenic weakness. Neither measurements of the relative sensitivity of different myasthenic muscles to *d*-tubocurarine [2] nor the reactions of such muscles to decamethonium salts [3] lend support. The latter consists in either tolerance to or the production of a competitive inhibition block by decamethonium iodide, a substance which normally acts as a pure depolariser. This phenomenon is explicable only in terms of local changes at the motor end-plates of myasthenics.

Finally, attempts to obtain direct evidence of the presence of a substance in the serum or thymus tissue of myasthenics, capable of depressing nerve-muscle preparations, have been numerous [4] and as contradictory as the results of thymectomy appear to be. In this connection, we note that Mr. Keynes states: "these thymus glands can be made to yield a potent extract which repeats on the laboratory bench the nerve-block effect ordinarily obtained with tubocurarine." In fact, according to the publication he quotes,[4] thymus extracts, while capable of depressing the response of nerve-muscle preparations to indirect stimulation, have not been shown to leave the response to direct stimulation unaffected, nor to produce a depressed response capable of reversal by neostigmine or worse on high rates of nerve stimulation. Thus, thymus extracts from myasthenics have not been shown capable of producing the competitive inhibition or curare-like neuromuscular block which is characteristic of the condition.

In summary, we suggest that the available clinical and experimental evidence indicates that the weakness in myasthenia gravis is due to local changes at the motor end-plates, and is not due to a circulating curare-like substance of thymic origin.

H. C. CHURCHILL-DAVIDSON
A. T. RICHARDSON.
London.

1. Denny-Brown, D. *Amer. J. Med.* 1953, **15**, 368.
2. Jarrett, P. S., Eaton, L. M., Lambert, E. M. *Amer. J. Physiol.* 1948, **155**, 3.
3. Churchill-Davidson, H. C., Richardson, A. T. *J. Physiol.* 1953, **122**, 252.
4. Wilson, A., Obrist, A. R., Wilson, M. *Lancet*, 1953, ii, 368.

Obituary

ANGELO LOUIS PETER PEENEY
M.R.C.S.

Dr. A. L. P. Peeney, director of the clinical pathological service of the Queen Elizabeth and General Hospitals, Birmingham, died in the Queen Elizabeth Hospital on June 10 at the age of 50.

He was a son of the late John Peeney of Blackpool, and he studied medicine at Manchester University, qualifying in 1928. After holding appointments as house-physician at the Manchester Royal Infirmary and the Brompton Hospital, London, he became a member of the staff of the Royal Infirmary laboratory, and later of the public-health laboratory, in Manchester. In 1936 he was appointed clinical pathologist to the Queen's Hospital, Birmingham. Two years later, when the Queen's ceased to be a general hospital, his laboratories were transferred to the new Queen Elizabeth Hospital, where he remained in charge of pathology and hæmatology until his death. In 1946 he was given supervision also of the corresponding laboratories at the General Hospital, and was appointed an honorary lecturer in his subject at Birmingham University.

Shortage of staff and the steady increase in routine work gave him little time during the earlier years for research, but when these burdens were eased he made valuable contributions to his special subject, notably on the action of the antibiotics and the blood picture in the sprue syndrome. His descriptions of this blood picture are some of the earliest and most accurate that have been given. But the bare outline of his career and the short list of his publications go little way towards accounting for the influence and esteem which Peeney enjoyed in his hospitals and outside them. H. M. S., a member of his staff, writes: "Peeney's papers bear only a token relation to his knowledge, acuteness, and industry. He did not confine his interests to one type of disease, leaving the rest to his juniors and to laboratory routine, and for all cases he set the most exacting standards of investigation. He saw patients himself; he learnt every detail about them; he considered their problems with an anxious care which was often prolonged far into the night. This diligence and his natural shrewdness gave him an almost divinatory power of diagnosis far beyond his own field, and he seemed to be consulted by everyone about everything. In later years the unceasing stream of doctors seeking for his help took up the greater part of his day, but it is safe to say not one of them ever received the impression that Dr. Peeney was sparing his time with reluctance. Another great host of visitors was his patients. Among them, his warm personal interest, his kindness, and his courtesy commanded extraordinary respect and affection. Those who came up regularly for routine examinations still wished always to see Dr. Peeney, if only for a moment, and were inclined to go away dissatisfied if for once they did not succeed. His attitude of universal kindness was not unallied to an amused penetration into the characters of others. His staff can affirm that his tolerance of their faults was due to charity and not to blindness. Nor was his devotion to his work due to narrowness of interests. He had a full appreciation of all the good things of life. Of sport, particularly cricket, he was a keen follower, and his knowledge of its annals appeared to have no limits."

T. L. H. looked upon Peeney's department as the pivot on which the medical activities of the hospital turned; "and the man measured up to the stature of his work. Humility, charity, wisdom, and humour were his in full measure and he held malice towards none. Nothing was too much trouble, and even when beset with the many cares of his office he was always available in his laboratory or in the wards for consultation. The reports from his department were models of lucidity, and when difficulties arose they were invariably followed by Peeney himself in an attempt to clarify an obscure problem—and I recall with gratitude and pleasure many fruitful conversations over morning coffee. When the history of the early years of the Queen Elizabeth Hospital comes to be written the name of Angelo Peeney will hold an honoured place. Meanwhile the hospital mourns the loss of a devoted servant, and his colleagues that of a lovable man. His memory will remain unforgettable and unforgotten."

Dr. Peeney is survived by his wife and a son.

DOUGLAS NOEL HARDCASTLE
M.R.C.S., D.P.M.

Dr. Noel Hardcastle, physician to the London Clinic of Psycho-Analysis, died on May 17 at the age of 62.

He was born in Brighton, the son of S. B. Hardcastle, and he studied medicine at St. Mary's Hospital, London, qualifying in 1915. He joined the R.A.M.C. almost at once and the following year went to France with the 60th London division. From 1920 to 1921 he served as a neurologist in charge of "shell-shock" wards at Ministry of Pensions hospitals in Edinburgh and Manchester.

After his return to civilian practice he took the D.P.M. in 1922 and was appointed to clinical assistantships at Bethlem Royal Hospital and in the psychiatric department at St. Mary's Hospital. He also continued to act as a specialist for the Ministry of Pensions at their London neurological clinic and to serve on their boards. During these years he served for a time on the staff of the Tavistock Clinic. In 1927 he was appointed to the staff of Moorcroft House under Dr. G. W. B. James, but in 1929 he gave up this post to spend three years of postgraduate study in the United States at child-guidance clinics in Philadelphia and Los Angeles. After his return to this country in 1932 he gave most of his time to this growing specialty. His work as the founder and director of the Fulham clinic quickly won recognition, and when child guidance was started by the Herts County Council, under the directorship of Dr. W. J. T. Kimber in 1934, Hardcastle was appointed psychiatrist to take clinical charge of the Hill End Hospital nerve clinic at St. Albans. He established the child-guidance service in Hertfordshire but resigned in 1938 because of ill health.

During the second world war he served as a psychiatrist with the Emergency Medical Service, first at Haymeads Emergency Hospital at Bishop's Stortford and later at Wharncliffe neurosis centre in Sheffield. Since 1943 he had been in consultant practice at Bishop's Stortford; he was also a physician on the staff of the London Clinic of Psycho-Analysis.

W. H. writes: "Dr. Noel Hardcastle was a keen thinker and observer of everything relating to the development and conflicts of children, and as the years went by he felt more and more the need to look for what was not on the surface. Uncompromising as he was, he underwent psycho-analytic training shortly before the second world war, and despite his age he insisted on seeing it through. In these last years, by combining work as a psychiatrist and psycho-analyst in a small provincial town with the pleasures of family life, he had found a solution for which other colleagues, perhaps with greater professional rewards, may silently envy him."

Dr. Hardcastle married Miss Kitty Duguid, who survives him with their three children.

SERGEI YUDIN
Hon. F.R.C.S.

Professor Yudin, chief surgeon of the Sklifosovski Hospital for Traumatic Diseases in Moscow and director of the surgical clinic of the Moscow Postgraduate Medical School, died on June 14 at the age of 64. He received the honorary fellowship of the English College in 1943.

Before the war Professor Yudin was chiefly known in this country for his use of stored cadaver blood for transfusion. As the central hospital for emergency surgery in Moscow the Sklifosovski Institute received many patients in urgent need of transfusion, while many severely injured people died in its receiving-rooms. Convenience may thus have led Yudin to use, and later to store, cadaver blood for the copious transfusions which he advocated, but he also believed that it had certain advantages over blood from a living donor—notably that it did not need the addition of an anticoagulant. A not unnatural repugnance had to be overcome, but in 1937 he was able to describe in our columns [1] an organisa-

1. *Lancet*, 1937, ii, 361

tion which he had built up over ten years, and to record that in over 1000 cases transfusions had been successfully given.

Yudin was also well known as a resourceful abdominal surgeon—he numbered his gastrectomies by the thousand. But during the war he turned his attention to the treatment of compound fractures. As his work on blood-transfusion showed, he believed in examining an urgent problem afresh, and the technique he advocated for these war injuries was different from the practice of most Western surgeons. He did not limit his intervention to casualties reaching operation within six to twelve hours, and he excised all necrotic tissues, making a large hole into the limb, and keeping it wide open by suturing the skin to the deep fascia not only in the primary wound but in any counter-opening that might be needed to secure free drainage.

When a British surgical mission visited Russia in 1943[2] they were struck by the vast scale on which surgery is done in the U.S.S.R., and one of the occasions of their wonder was to find their newly elected honorary fellow doing three operations in one day for the replacement of permanently obstructed œsophagus by jejunum, working with an astonishing rapidity and ease of technique.

Sir JAMES SPENCE

FEW men have the qualities of heart and mind required of a great teacher, but Sir James Spence possessed them in abundant measure. It was inevitable that young men were attracted to work with him, for he was a master of his subject, and, possessing a sensitive human philosophy of life, he liked helping and stimulating young men. From many parts of the United Kingdom and British Commonwealth of Nations men sought training with him, and as an Australian I had the honour and privilege of serving as a member of his team. My association with him developed into a warm friendship over the years, for it was characteristic of him to maintain an interest and help those who had worked with him.

In addition to his outstanding ability as a teacher James Spence made two great contributions to pædiatrics. The first was his work on the care of children in hospital, the second in the field of clinical science. His wide knowledge of medicine and society, together with a humanitarian philosophy, were responsible for his revolt against the common and often rather inhuman practice of segregation of infant and child from its mother both in obstetric and children's hospitals. The principles of his practice of mother-child care in hospitals have now been widely accepted, and have done much to improve the care of the infant and child while in hospital and to abolish parental and child anxiety. In the field of clinical science Spence adopted the study of the whole individual and his environment. He maintained that this approach had been largely neglected and that there was much to learn, especially in children's illness. His departmental study of the illnesses and environment of a thousand families is an outstanding model and contribution towards understanding common family problems and illnesses.

He built his house well, for those young men whom he inspired and taught will carry on his work.

Melbourne, Australia. H. W.

Dr. A. O. F. ROSS

E. E. P. writes: "A. O. F. Ross was not only one of the most distinguished venereologists of the day, but a man with an exceptionally broad background of knowledge. His enthusiasm and burning zeal were contagious and he shone as a teacher. He had unfailing sympathy and understanding, and generations of seafarers have reason to be grateful for his care and attention. He was a great doctor and a delightful host, and his great sense of humour made him a most amusing correspondent. He endeared himself to all; our hearts are heavy at his going."

2. *Ibid*, 1943, ii, 198.

Births, Marriages, and Deaths

BIRTHS

MANN.—On June 5, at Brighton, to Joy, wife of Dr. Trevor P. Mann—a third son.

Diary of the Week

JUNE 20 TO 26

Monday, 21st

UNIVERSITY OF LONDON
5 P.M. (University College Hospital Medical School, University Street, W.C.1.) Prof. B. T. Mayes (Sydney): Postpartum Hæmorrhage.

POSTGRADUATE MEDICAL SCHOOL OF LONDON, Ducane Road, W.12
4 P.M. Dr. Brian Ackner: Psychiatric Problems during Pregnancy and the Puerperium.

INSTITUTE OF OBSTETRICS AND GYNÆCOLOGY
2 P.M. (Hammersmith Hospital, Ducane Road, W.12.) Prof. J. Louw (Cape Town): Pelvic Inflammation.

Tuesday, 22nd

ROYAL COLLEGE OF SURGEONS, Lincoln's Inn Fields, W.C.2
3.45 P.M. Prof. R. J. Last: Pectoral Girdle. (Arnott demonstration.)

Wednesday, 23rd

ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, W.1
5 P.M. *Section of Endocrinology.* Dr. G. W. Thorn (U.S.A.): Diagnosis and Treatment of Disturbance in Adrenal Cortical Function.

INSTITUTE OF DERMATOLOGY, St. John's Hospital, Lisle Street, W.C.2
5.30 P.M. Dr. H. Haber: Acantholysis.

Thursday, 24th

UNIVERSITY OF OXFORD
8.30 P.M. (Nuffield Orthopædic Centre, Wingfield-Morris Orthopædic Hospital.) Prof. C. G. Rob: Present Status of Blood-vessel Grafting.

HONYMAN GILLESPIE LECTURE
5 P.M. (University New Buildings, Teviot Place, Edinburgh.) Mr. D. L. Savill: Ankylosing Spondylitis.

Friday, 25th

POSTGRADUATE MEDICAL SCHOOL OF LONDON
2 P.M. Mr. T. McW. Millar: Surgical Experiences in Treatment of Obstructive Jaundice.
4 P.M. Dr. E. G. L. Bywaters: Collagen Diseases.

ROYAL SOCIETY OF MEDICINE
8.15 P.M. *Section of Obstetrics and Gynæcology.* Professor Mayes: Cæsarean Section and Management of Subsequent Pregnancy and Labour.

INSTITUTE OF CARDIOLOGY
5 P.M. (1, Wimpole Street, W.1.) Dr. Graham Hayward: Pulmonary Œdema. (St. Cyres lecture.)

INSTITUTE OF LARYNGOLOGY AND OTOLOGY, 330, Gray's Inn Road, W.C.1
3.30 P.M. Mr. K. G. Rotter: Otitis Media in Children and Infants.

Appointments

BYRNE, UNA B., M.B. Belf., D.A.: anæsthetist, Fermanagh H.M.C.

DOWNING, D. M., M.B. Belf., D.A.: anæsthetist, North Antrim group of hospitals.

FLOOD, J. J., M.B. N.U.I., D.P.M.: senior asst. R.M.O., The Priory, Roehampton, S.W.15.

* HEPPLESTON, J. D., M.B. Manc., DIP. PATH.: consultant pathologist, South Cheshire Hospital centre.

JUSTICE, J. J., M.B., B.SC. Glasg., D.P.M.: consultant psychiatrist and medical superintendent, St. Mary's Hospital, Stannington.

LAURIE, ALEXANDER, M.B. Glasg., D.P.H.: asst. county M.O.H., Derbyshire, and M.O.H., borough of Ilkeston and urban districts of Alfreton and Ripley.

RAMSAY, CHRISTINE M., M.B. Lond., D.A.: anæsthetist, Royal Cancer Hospital, London.

SIDDLE, J. L., M.B. Durh., D.P.H.: asst. county M.O., Durham (No. 4 area), M.O.H., urban and rural districts of Chester-le-street.

Appointed Factory Doctors:

CADENHEAD, R. McN., M.B. Aberd.: Lerwick, Shetland.
KILVERT, E. E. K., M.B. Birm.: Clevedon, Somerset.
ROWNTREE, J. K., M.R.C.S.: Grantham, Lincoln.

The Bethlem Royal Hospital and the Maudesley Hospital:

HOBSON, R. F., B.A., M.D. Camb., D.P.M.: physician.
HOFFER, WILLI, M.D., PH.D. Vienna, L.R.C.P.E.: physician.
REES, W. L. L., M.D., B.SC. Wales, M.R.C.P., D.P.M.: physician.

South-Western Regional Hospital Board:

AZAM, M. A., M.B. Punjab, F.R.C.S.E.: surgical registrar, South Devon and East Cornwall Hospital, Plymouth.
BALMFORTH, G. V., M.B. Lond., D.OBST.: medical registrar, Gloucestershire Royal Hospital, Glos.
COLE, PAULINE, M.B. Lond., D.C.H.: pædiatric registrar, South Devon and East Cornwall Hospital, Plymouth.
DUTTON, J. E. M., M.B. Durh., F.R.C.S.: senior registrar, department of neurological surgery, Frenchay Hospital, Bristol.
GERRARD, JEAN O., M.B. St. And.: anæsthetic registrar, Bath group of hospitals.
HOY, C. H. A., M.B. Lond.: surgical registrar, Torquay and Newton Abbot hospitals.

Welsh Regional Hospital Board:

CORRADO, H. A., M.D. Malta: asst. chest physician (S.H.M.O.), Caernarvon and Anglesey H.M.C.
COSGROVE, P. C., M.B. Dubl., F.R.C.P.I., D.T.M. & H.: asst. chest physician (S.H.M.O.), Swansea.
SEAL, R. M. E., M.B. Wales, M.R.C.P.: consultant pathologist, Sully Hospital.

* Amended Notice.

Notes and News

AN APPEAL FOR THE RHEUMATIC

THE British Rheumatic Association has prepared a five-year plan including the setting up of special hostels, the promotion of medico-industrial reablement, village and home treatment, and measures to help the sufferer to help himself. To get this plan going an appeal is being made for £75,000 in the first year and £150,000 in subsequent years. At a luncheon held in London on June 10 Mr. Tom Williams, who presided, said that there were so many sufferers from rheumatism that the disease was often taken for granted; but the country could not afford to take it for granted any longer. Lord Horder, as "the father of the Empire Rheumatism Council," said that the council had primarily taken on the function of research, but at the same time had tried to make people understand how widespread and painful and costly the disease was. Ten years ago, in "A Plan for National Action," he had hammered on the doors of the Ministry of Health; and these had opened a little way—only alas to shut again. He hoped that the British Rheumatic Association would (1) do something to make early diagnosis easier, and (2) do something for patients after they had been treated in hospital. Here they would be undertaking work that the Empire Rheumatism Council could not undertake. And he hoped that they would mobilise public opinion, which could be done only by voluntary effort. When public opinion was mobilised, the official doors would open again.

Sir Walter Puckey explained that the association's scheme would be of direct value to industry. Rheumatism stood very high on the list of causes of absenteeism and loss of production. It was estimated that the disease caused the loss of some three million working weeks every year, and in terms of sickness benefit, medical care, and production loss the cost was put as high as £250 million a year—all this apart from the human suffering. As chairman of the Pioneer Hostel established at Bracken Hill House, Northwood, by B.R.A. Homes Ltd., of which he is chairman, Sir Walter expressed the hope that many other hostels of the same kind would be set up. Dr. Francis Bach said that rheumatism was not taken seriously enough in the early stages either by the sufferer, by the manager, or by the doctor. Also there should be more understanding of the importance of the relation between the man, his employer, and his work. Four stages of disability could be recognised: some patients regained full working capacity; a second group, though handicapped, could also carry on. A third group, however, required sheltered conditions and these ought to be provided. Many people, though called cripples, still could fill an important place in industry: if the kitchen does not suit one's wife, one does not change one's wife but modifies the kitchen—and similarly industrialists should modify their industrial processes. Work could be provided, too, for the home-bound. All this required careful planning; and at present, though the majority of rheumatism patients were fit to go back to work of some kind, it was extremely hard to get them replaced in industry.

The association's address is 11, Beaumont Street, W.1.

WELFARE FOODS

WHEN the local offices of the Ministry of Food close at the end of June, welfare foods—liquid milk, National dried milk, cod-liver oil, orange juice, vitamin tablets—will still be available for expectant mothers and young children, but the following changes will be made in the system:

Distribution.—From June 28 the foods themselves (except liquid milk) will be distributed by the local health authority at welfare clinics or other convenient centres. Liquid milk will continue to be distributed by dairymen.

Entitlement Documents.—Until the end of October, when a new system will start, existing ration books will continue to be used as proof of entitlement for expectant mothers, babies, and young children. These books should, therefore, be preserved carefully when food rationing ends in July. New applications for entitlement documents should be made to the local office of the Ministry of Pensions and National Insurance or, in some places, the Ministry of Labour and National Service.

SYMPOSIUM ON TUBERCULOSIS

THE latest issue of the *British Medical Bulletin*[1] contains a symposium on tuberculosis covering a large field stretching from laboratory research to the organisation of chest clinics. The quality of the articles varies widely. Some are outstanding, especially those on vaccination with the vole bacillus, the relationship between the host cell and the parasite, the action of cortisone and certain surface-active agents on the tuberculous animal, and the detection of pulmonary tuberculosis in a community. The article on drug resistance may possibly confuse but will certainly stimulate the reader; and the importance of this subject to the clinician is admirably discussed by Dr. J. G. Scadding, the scientific editor. It is a pity that a few contributors seem to have forgotten that the *Bulletin* is intended primarily for foreign readers. A didactic style and criticism of the health and social services in this country are out of place in it.

1. *Brit. med. Bull.* 1954, **10**, no. 2. London: British Council. **15s.**

SLEEP HABITS OF SCHOOL-CHILDREN

WE do not know how many hours of sleep any person needs, or (which is a different thing) how many he could use with advantage, given the opportunity. The need, in any case, varies from person to person, and in the same person over a lifetime.

Dr. G. P. McLauchlan[1] has made a small study of the sleep habits of children, aged $10^1/_2$–$11^1/_2$, attending county primary schools in Guildford. All the children were examined physically and "no child with any defect likely to interfere with his wellbeing was included in the survey." The sleep habits of the 250 accepted for study were established by questioning them and their mothers. Their bedtimes varied widely, one of them going to bed at 6.30 P.M. and three at 10 P.M.; the largest number, however, went to bed at 8 o'clock. Most of them awoke or were awakened between 7 and 8 A.M. though one boy regularly wakened at 5. But going to bed is one thing and going to sleep is another; and McLauchlan took the precaution of finding out how long they stayed awake after getting there. An estimate based on the answers of the mothers and children suggests that one child was having as little as $7^1/_2$ hours' sleep while three were getting as much as $12^1/_2$ hours. The largest number got 11 hours, and some five-sixths of the total were having 10–$11^1/_2$ hours.

Sleep, however, varies in quality as well as quantity; and he quotes the work of Davis et al.[2], who distinguished, by electro-encephalography, five depths of sleep, merging into one another: (1) a stage of dropping off to sleep when one is neither asleep nor awake; (2) a stage of light sleep; (3) a deeper stage in which one can yet be easily disturbed; (4) sound sleep, in which the patient is not easily disturbed; and (5) really deep sleep. The depth of sleep varies in the course of the night, and in children the variation follows a fairly definite pattern. Depth of sleep increases rapidly from the moment the child falls asleep, and reaches a maximum by about the end of the 1st hour. Sleep then becomes progressively lighter until about the 6th hour, after which it again deepens, to reach a second period of great depth at the 8th or 9th hour. After that it becomes lighter again until the child wakes, or dozes until called. McLauchlan draws the conclusion, which may or may not be justified, that if a child is hard to waken in the morning he has not completed his sleep cycle, and so has not had as much sleep as he needs. Of his 250 children, 184 (three-quarters) wakened of their own accord, 53 wakened easily on being called, and 13 were difficult to waken.

He noted, too, that 43 of the children had a poor appetite for breakfast, a symptom which is also thought to be associated with a sleep deficiency; and indeed 7 of the 43 were among those difficult to waken. There were thus 49 children, who, judged by these standards, might be going short of sleep. But—unless their requirements were much above the average—the deficiency for most of them was not in quantity: for four-fifths of them were in bed by 8.30 and all but 5 were getting 10–12 hours' sleep. Some of them took longer to go to sleep than the other children studied, only slightly over half of them being asleep 30 minutes after going to bed, as against four-fifths of the rest. Reading in bed cannot be blamed, for only 9 of them enjoyed this privilege. Neither sharing a room nor sharing a bed seemed to interfere much with their sleep, and in any case more than two-thirds of them had a bed to themselves. Presumably their sleep deficiency was therefore a matter of quality rather than quantity; but it is hard to be sure from this study that these 49 children really were suffering from a lack of sleep. If they were, it had evidently not affected their health seriously, or they would not have been included in the survey. Their inability to waken easily and their lack of appetite for breakfast are interesting symptoms, certainly, but they are surely susceptible of other explanations besides a lack of sleep.

1. *Med. Offr*, 1954, **91**, 261.
2. Davis, H., Davis, P. A., Loomis, A. L., Harvey, E. N., Hobart, G. *J. Neurophysiol.* 1937, **1**, 24.

SPECIAL DIETS

THE Hospital Catering Advisory Service of King Edward's Hospital Fund for London has issued a useful booklet for the guidance of catering officers, kitchen superintendents, and housekeeping and nursing sisters at smaller hospitals where there is no trained dietitian.[1] The essentials of a balanced diet are explained, and, on the basis of this, various special diets are described: for diabetes; for reducing weight; gastric diets; bland low-residue diets; diet for occult-blood test; high-protein and low-protein diet; low-fat diet; salt-free diet; and gluten-free diet. A specimen kitchen sheet is given, and there are recipes for gastric diets, for sauces for fat-free diets, and for using gluten-free flour.

University of London

Dr. C. B. B. Downman, senior lecturer at St. Thomas's Hospital Medical School, has been appointed to the readership in physiology at the Royal Free Hospital School of Medicine.

Among those on whom the university will confer honorary degrees to celebrate foundation day on Nov. 26 is Sir Rudolph Peters, F.R.S., who will receive the degree of D.SC.

University of Durham

Mr. D. J. Tibbs, first assistant in the department of surgery, has been appointed reader in surgery in the Newcastle division.

Royal College of Surgeons of England

The directors-general of the medical services of the Armed Forces attended a meeting of the council held on June 10, when the following medals were presented:

The Sir Gilbert Blane medal to Surgeon Commander J. L. S. Coulter; the Mitchiner medal to Lieut.-Colonel H. D. Chalke; and the Lady Cade medal to Squadron-Leader R. R. L. Pryer.

Mr. R. S. Handley (Middlesex Hospital) was admitted to the court of examiners, and Mr. D. M. E. Thomas (Sully, Glam) and Mrs. Dorothy Campbell (Coventry) were admitted to the fellowship.

The following were coöpted to the council for the year 1954–55 representing various branches of practice:

Dr. O. C. Carter (general practice), Prof. A. M. Claye (gynæcology and obstetrics), Mr. Myles L. Formby (otolaryngology), Dr. Bernard Johnson (anæsthetics), Mr. A. B. Nutt (ophthalmology), Dr. E. Rohan Williams (radiology). Prof. F. C. Wilkinson was invited to act as the representative of dental surgery.

The following examiners were appointed for the ensuing year:

Fellowship.—Ophthalmology: E. A. Blake Pritchard. Anatomy: D. N. Matthews, Mary F. Lucas Keene, Lambert C. Rogers, R. J. Last. Applied Physiology and Pathology: Geoffrey Hadfield, Albert Hemingway, J. L. D'Silva, H. A. Magnus.

Diploma of L.R.C.P., M.R.C.S.—Elementary Biology: Alan Fisk, G. E. H. Foxon. Anatomy: Thomas Nicol, E. W. T. Morris, A. J. Heriot. Physiology: C. C. N. Vass, Esther M. Killick. Midwifery: R. G. Maliphant, W. R. Winterton, H. H. Fouracre Barns, Ian Donald. Pathology: L. E. C. Norbury, Joseph Bamforth, A. C. Cunliffe, V. C. Pennell.

Diplomas of fellowship were granted to the following:

F. L. Davies, M. J. May, H. F. McG. Bassett, A. L. T. Easton, N. C. Rees, *M. J. Gilkes, W. J. Gall, F. E. Weale, A. L. Levene, I. L. Macfarlane, M. A. Brennan, W. F. W. Southwood, A. A. Eley, Gerald Keen, O. L. Thomas, † A. G. Ackerley, Pamela M. Moody, F. H. Haine, Daya Shanker Kaicker, Anand Narain Razdan, † D. R. Scorgie, A. S. Dawson, Joseph Hirtenstein, † J. S. Martin, Kamel Mohamed Said, Michael Salvaris, Philip Goldstein, G. N. Perera, E. A. M. Ryan, *T. A. S. Boyd, P. F. Early, Catherine N. McRobert, Chimanbhai Jiwabhai Patel, Pesi Behramsha Bharucha, J. L. Edmondson, P. D. Hill, N. H. Birch, Ben-Ami Eilenberg, John Kirk, Chimanbhai Chaturbhai Patel, Nader Mohamed Souelem, Tarun Kanti Banerjee, *J. D. Brosnan, J. R. Dickson, Michael Kugler, M. E. Lake, T. D. H. Perera, † B. H. Pickard, Khalid Abdul Azize Qassab, Piyasiri Rathnapala Walpita, J. A. M. White, Mohamed Yassin Ahmed Alyan, I. M. Cran, Ahmed Refaat El Mazny, Colm Galvin, J. G. Hamilton, † Akkinepalli Badri Narayan, Rao, J. S. Roarty, † H. W. H. Sheppard, H. F. R. Story, † T. P. Cannon, Sukumar Das, M. J. Gallagher, J. E. Howson, J. F. Lee, Alexander McCalister, Tassaduk Hussain Moghul, Bernard Murphy, J. P. O'Neill, † P. B. O'Neill, D. N. Robinson, E. F. Soothill, R. T. Todd, W. F. Walker, Kadirbukhsh Yar Mohammed Ansari, R. A. Bailey, S. C. Baker, A. J. Davies, J. K. Francis, F. C. Hoyte, W. J. Metcalfe, Charles Miller, L. J. Opit, N. H. Porter, † Noel Roydhouse, Hassouna Mahmoud Saba, L. A. Wells, T. G. Lorentz, Maqbool Ahmad, Krishna Kant Bhatnagar, J. H. Kettle, Sarinder Man Singh.

* In ophthalmology. † In otolaryngology.

The fellowship of the faculty of anæsthetists was granted to B. H. Smith, and a diploma of membership of the college to H. N. Baylis.

1. Memorandum on Special Diets. 1954. Obtainable from King Edward's Hospital Fund for London, 10, Old Jewry, London, E.C.2. Pp. 36. 1s. post-free.

Royal College of Physicians of London

Dr. E. B. Verney, F.R.S., will deliver the Bertram Louis Abrahams lecture on Thursday, July 8, at 5 P.M., at the college, Pall Mall East, S.W.1. He is to speak on Renal Excretion of Water and Salt.

Royal College of Surgeons in Ireland

At a meeting of the college on June 7, the following officers were elected:

President, Ian Fraser; vice-president, A. B. Clery; other members of council, J. F. L. Keegan, R. A. Stoney, Henry Stokes, J. F. Devane, William Pearson, A. A. McConnell, T. O. Graham, William Doolin, Frederick Gill, T. G. Wilson, M. P. Burke, C. H. G. Macafee, R. R. Woods, S. F. Heatley, J. H. Coolican, T. A. Bouchier-Hayes, N. A. Kinnear, E. W. L. Thompson, J. M. McA. Curtin.

Royal College of Physicians of Ireland

At a meeting of the college held on June 4, with Dr. Edward Freeman, the president, in the chair, the following were admitted to the fellowship:

Alan Proctor Grant, Rex St. John Lyburn (in absentia).

The following were admitted to the membership:

H. T. F. Barniville, Mary E. Bewley, F. R. Counihan, C. K. Heffernan, Ferdinand Hillman, M. J. Lalor, A. J. MacDonald, Hugo McVey, Samuel Miller, W. A. Norris, A. P. H. Randle, Charles Reid, D. S. Wilson.

Lady Tata Trust

The trustees of this fund announce that they have made the following awards for research on leukæmia and allied diseases, in the year beginning next October:

Grants for research expenses.—Dr. Astrid Fagraeus and Dr. Bo Thorell (Stockholm); Dr. Jo Nordmann (Paris); Dr. Arunachala Sreenivasan (Bombay).

Senior research fellowship.—Dr. Jørgen Kieler (Copenhagen).

Scholarships.—Dr. Ragna Rask-Nielsen (Copenhagen); Dr. Roger Robineaux (Paris); Dr. Flemming Kissmeyer-Nielsen (Aarhus, Denmark); Dr. N. A. Stenderup (Aarhus, Denmark); Dr. Jørgen Ringsted (Copenhagen); Dr. Jørgen Rygaard (Copenhagen).

Part-time scholarship and grant for research expenses.—Dr. Maxime Seligmann (Paris).

A special scholarship awarded to Dr. Gavino Negroni (Italy), for work at the Imperial Cancer Research Fund Laboratories, will continue until April 30, 1955.

Mackenzie Industrial Health Lecture

Dr. W. M. Goldblatt will give the Mackenzie lecture on Tuesday, July 13, at 2.30 P.M. in the Library Theatre, Manchester. He will speak on Research in Industrial Health in the Chemical Industry.

North of England Society of Anæsthetists

On May 21 Dr. E. J. Millar, the president, presented the registrar's prize to Dr. F. Sorrell for his essay on bronchospasm. Dr. M. H. Armstrong Davison was elected president for the coming session, and Dr. E. I. Tate was re-elected hon. secretary.

Northern Ireland Health Services

Sir George Henderson, Mr. J. V. S. Mills, and Mr. H. G. Tanner (chairman) have been appointed to advise minister of health and local government on the health services in Northern Ireland. Dr. G. C. Kelly and Mr. N. Dugdale will act as joint secretaries to the advisers.

Wellcome Research Laboratories

Colonel H. W. Mulligan has been appointed head of the biological division of these laboratories, in succession to Dr. J. W. Trevan, F.R.S., who retired last year.

After graduating M.B. from the University of Aberdeen in 1923, Colonel Mulligan joined the Indian Medical Service. He was posted to its medical research department in 1928 and he remained in this branch, except for three years on active service during the war, ultimately becoming consultant malariologist, Persia and Iraq Command. Among the appointments he held in India were those of director of the Pasteur Institute, Coonoor, and later of the Central Research Institute, Kasauli, where he had earlier been in charge of the serum and vaccine department. When the I.M.S. was disbanded in 1947 he went to West Africa to set up the African Institute for Trypanosomiasis Research. Colonel Mulligan is the West African representative on the Scientific Council for Africa, and a member of the International Scientific Committee for Trypanosomiasis Research and of the World Health Organisation expert panel on parasitic diseases. During the last three years he has shared in planning the West African Council for Medical Research, which was established a few months ago.

CORRIGENDUM.—The late Prof. J. B. Buxton, whose death we recorded last week, was president of the Royal College of Veterinary Surgeons in 1932–33, and in 1936 he became principal of the Royal Veterinary College.

Breaking through the barrier

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Academic and Educational

THE UNIVERSITY OF LEEDS

DIPLOMA IN PSYCHOLOGICAL MEDICINE

A course for the Diploma in Psychological Medicine will commence in OCTOBER, 1954, if sufficient entries are received. Instruction will be part-time and will occupy 3 half-days a week during 8 academic terms (2¼ years).

Further particulars may be obtained from the Sub-Dean, School of Medicine, Leeds, 2, to whom application for admission to the Course should be sent as soon as possible.

THE UNIVERSITY OF SHEFFIELD

COURSES OF INSTRUCTION for the DIPLOMA IN MEDICAL DIAGNOSTIC RADIOLOGY (D.M.R.D.) AND THERAPEUTIC RADIOLOGY (D.M.R.T.) will commence in OCTOBER, 1954. The Courses will cover a period of 2 years of whole-time study, and the fee for each course is 50 guineas.

Applications to attend should be sent to the Dean of the Faculty of Medicine, The University, Sheffield, 10.

EDINBURGH POST-GRADUATE BOARD FOR MEDICINE

GENERAL SURGERY

3 months courses of post-graduate surgery are arranged to start on 27TH SEPTEMBER, 1954, and 21ST MARCH, 1955. These are suitable for surgeons requiring refresher courses in the current outlook on general surgery, or for graduates preparing to specialise in surgery; approximately 275 hours of instruction are provided. Fee £31 10s.

INTERNAL MEDICINE

Courses lasting 12 weeks, suitable for graduates wishing a refresher course, or to specialise in medicine, begin on 27TH SEPTEMBER, 1954, and 28TH MARCH, 1955. These courses consist of 320 hours instruction, comprising lectures, clinical demonstrations and ward visits. Fee £31 10s.

Additional instruction in clinical pædiatrics is arranged in conjunction with the course in medicine, for which there is a small fee; the numbers are limited.

Applications for enrolment should be addressed to the Director of Post-Graduate Studies, Surgeons' Hall, Edinburgh, 8, supplying particulars of qualifications and post-graduate experience.

NATIONAL HEART HOSPITAL

Westmoreland-street, W.1, and BUCKINGHAM

The ST. CYRES LECTURE for 1954 will be delivered in the Barnes Hall of the Royal Society of Medicine, 1, Wimpole-street, W.1, on FRIDAY, 25TH JUNE, at 5 P.M. by Dr. GRAHAM HAYWARD.

Subject: "Pulmonary Œdema."

Members of the Medical Profession are cordially invited.

CENTRAL MIDDLESEX GROUP HOSPITAL MANAGEMENT COMMITTEE

TAVISTOCK CLINIC

ELEMENTARY PSYCHOTHERAPY COURSE

The Adult Department of the Tavistock Clinic announces a 2-year course in the elements of psychotherapy, psychopathology and therapeutic group experience, for psychiatric trainees and specialists. Up to 8 students will be admitted at the discretion of the Training Committee.

The Course requires attendance on 2 late afternoons and evenings per week in term-time, and will begin early in OCTOBER, 1954.

Applications by 15th July to the Training Secretary, Tavistock Clinic, 2, Beaumont-street, W.1, from whom further particulars may be obtained.

INSTITUTE OF NEUROLOGY (Queen-square)

2 COURSES OF CLINICAL DEMONSTRATIONS, open to Post-graduates, will be held at The National Hospital, Queen-square, ON WEDNESDAYS at 4 P.M. from 7TH JULY to 22ND SEPTEMBER, 1954, inclusive, and on SATURDAYS at 10.30 A.M. from 10TH JULY to 25TH SEPTEMBER, 1954, inclusive.

The fee for attending either course is 1 guinea.

Application for a ticket should be made to The Dean, Institute of Neurology (Queen-square), The National Hospital, Queen-square, W.C.1, and a remittance to cover the fee enclosed. Only postal applications will be considered.

THE ROYAL SOCIETY

GOVERNMENT GRANT FOR SCIENTIFIC INVESTIGATION

Applications for grants from the second allotment of the Government Grant for Scientific Investigations for the year 1954 should be made as soon as possible on forms of application to be obtained from the Assistant Secretary of the Royal Society, Burlington House, London, W.1. No application can be considered which is received later than 31ST JULY, 1954.

Applicants must be of British nationality, resident in Great Britain or Northern Ireland. Grants may be made for purposes in connection with the promotion and support of research in pure science other than for personal maintenance or payment of stipends; for the assistance of scientific expeditions and collections; but not in aid of scientific publications.

QUEEN CHARLOTTE'S AND CHELSEA HOSPITALS. BERNHARD BARON MEMORIAL RESEARCH LABORATORIES. A REGISTRAR will be required in September at the above Laboratories. Previous specialised experience is not essential. The successful candidate will receive training in serology and bacteriology, and may later assist in the research work. The post is resident, but it may be possible to live out by arrangement.

Applications to the Secretary to the Board of Governors by 5th July on forms obtainable from 339, Goldhawk-road, London, W.6.

DUNFERMLINE COLLEGE OF PHYSICAL EDUCATION. Applications are invited from Women for the post of MEDICAL OFFICER AND PRINCIPAL LECTURER in Anatomy, Physiology and Health Education. The duties as Medical Officer will include the routine medical examination of students in training and candidates before entrance, but not the ordinary medical attendance on students. The salary scale is £1050–£50–£1250, with placing according to qualifications and experience. This post will be vacant in September, 1954.

Application forms and conditions of appointment may be obtained from the Principal, Dunfermline College of Physical Education, Woolmanhill, Aberdeen, to whom the completed form of application, with letter stating qualifications in detail, should be sent as soon as possible and not later than Wednesday, 7th July, 1954.

THE WELSH NATIONAL SCHOOL OF MEDICINE. Applications are invited for the appointment of LECTURER (full-time) in the Professorial Medical Unit. The appointment will be for a period of 2 years in the first instance, at a salary within the scale applicable to Lecturers in Clinical Departments. There are superannuation and family allowance schemes in operation.

Further particulars of the appointment may be obtained from the undersigned, by whom applications should be received within 3 weeks of the appearance of this advertisement.

34, Newport-road, Cardiff. F. DODSWORTH, Secretary.

THE UNIVERSITY OF BIRMINGHAM. Faculty of MEDICINE. Applications are invited for 2 LECTURESHIPS IN PATHOLOGY. The appointments will be made on an annual basis, with possibility of reappointment up to a maximum of 3 years. It is intended that 1 of the posts will be filled by a trainee without previous experience in pathological work. The Department is responsible for the service in morbid anatomy and histology to the United Birmingham Hospitals. Duties will also include teaching, and there are opportunities for research. Commencing salary in the range £700–£1100 depending on qualifications and experience.

Applications, with the names of 2 referees, should be received by the Assistant Registrar, The Medical School, Birmingham, 15, not later than 10th July, 1954. Further information may be obtained from the undersigned.

C. G. BURTON, Secretary.

The University, Birmingham, 3.

THE UNIVERSITY OF LIVERPOOL. Applications are invited for the post of LECTURER in the Department of Bacteriology. Preference will be given to medically qualified candidates. The salary will be within the range £900–£1200 p.a. according to age, qualifications and experience of the successful candidate.

Applications, stating age, qualifications and experience, together with the names of 3 referees, should be received not later than 3rd July, 1954, by the undersigned, from whom further particulars may be obtained.

STANLEY DUMBELL, Registrar.

THE UNIVERSITY OF SHEFFIELD. Applications are invited for a post of LECTURER or RESEARCH ASSISTANT IN BACTERIOLOGY AND VIRUS DISEASES in the Departments of Bacteriology and Medicine. Salary scales, Lecturer £700–£100–£1500; Research Assistant—to be determined at time of appointment. Initial salary for either post according to qualifications.

Applications (6 copies) should be sent to the Registrar, from whom further particulars may be obtained, not later than 17th July, 1954.

UNIVERSITY OF LONDON KING'S COLLEGE will require on 1st October, 1954, a LECTURER IN PHYSIOLOGY. The appointment will be on the Junior Lecturer scale of £600–£50–£750, with family allowances and F.S.S.U. benefits.

Particulars and application forms should be obtained from the Registrar, King's College, Strand, W.C.2, whom completed applications should reach by 10th July.

UNIVERSITY OF OTAGO, Dunedin, New Zealand. The University of Otago proposes to appoint a PROFESSOR OF MICROBIOLOGY, to take up office as soon as convenient. Salary £2002 8s.–£2502 8s. p.a.

Further particulars are available from the Secretary, Association of Universities of the British Commonwealth, 5, Gordon-square, London, W.C.1. Applications close in London and New Zealand on 31st July, 1954.

UNIVERSITY OF MALAYA, Singapore. Applications are invited for LECTURESHIP or SENIOR LECTURESHIP IN MIDWIFERY AND GYNÆCOLOGY. Salary on scale £1330–£70–£1610 p.a. (Senior Lecturer) or £854–£42–£1400 p.a. (Lecturer). Status and point of entry determined by qualifications and experience. Allowances: expatriation in range £210–£280 p.a., cost-of-living in range £294–£637 p.a., for medical qualification £210 p.a. (temporary), in lieu of consulting practice £280 p.a. All paid in Malayan currency. Free passages for appointee, wife, and children under 12 years. Part-furnished quarters at low rent or housing allowance in lieu. Provident fund scheme.

Applications (6 copies), naming 3 referees and stating full qualifications and experience, to be received by 31st July, 1954, by Secretary, Inter-University Council for Higher Education in the Colonies, 1, Gordon-square, London, W.C.1, from whom further particulars may be obtained.

THE INSTITUTE OF RHEUMATIC DISEASES founded by the Kensington Division of the B.R.C.S. at The Limes, Holland Park-gardens, W.14, will remove on 28th June, 1954, to new premises specially designed for its work, at St. Mary Abbots Hospital. It will have the same personnel and character, and will work in close association with the Hospital.

"Mental Testing of the Very Young," a Course of Lectures, Demonstrations and Discussions for Medical Officers, to be held in Hampstead, 18th–23rd July.—Full particulars, Address, No. 942, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Hospital Services : Senior Appointments

NATIONAL HOSPITALS FOR NERVOUS DISEASES. The Board of Governors invites applications for the appointment of PHYSICIAN to the Department of Psychological Medicine (Consultant status) at the Maida Vale Hospital for Nervous Diseases, Maida Vale, W.9. Applicants must be Fellows or Members of the Royal College of Physicians of London and possess a qualification in psychological medicine. The appointment will be part-time and the successful applicant will be required to attend up to 4 half-days per week.

Applications (35 copies), giving the names of 3 referees, must be sent to the undersigned not later than 3rd July, 1954.

H. EWART MITCHELL, Secretary.

The National Hospitals for Nervous Diseases,
Queen square, W.C.1.

NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD.

(1) CONSULTANT OPHTHALMOLOGIST (2 half-days a week ; at present Monday and Thursday A.M.), King Edward VII Hospital, Windsor (517 Beds).

Applications by 23rd July, 1954.

(2) CONSULTANT OPHTHALMIC SURGEON (5 hours a week), Royal Northern Hospital, Holloway, N.7 (279 Beds).

Applications by 23rd July, 1954.

(3) CONSULTANT ANÆSTHETIST (2 half-days a week), Hendon District Hospital, N.W.4 (63 Beds).

Applications by 26th July, 1954.

(4) CONSULTANT OBSTETRICIAN AND GYNÆCOLOGIST (6 half-days a week), Windsor Group of hospitals, mainly King Edward VII Hospital (517 Beds) and Maidenhead Hospital (100 Beds). Successful candidate required to live in area.

Applications by 3rd August, 1954.

(5) CONSULTANT NEUROLOGIST for 2 half-days a week at West End Hospital for Nervous Diseases, 73, Welbeck-street, W.1.

Applications by 20th July, 1954.

Hospitals may be visited by direct appointment.

Application forms obtainable from and returnable to Secretary, North West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1.

BRISTOL CLINICAL AREA. South-Western Regional HOSPITAL BOARD. Applications are invited from registered medical practitioners for the appointment of OPHTHALMOLOGIST in the Bristol Clinical Area. The appointment will be on a whole-time basis in the Senior Hospital Medical Officer grade. The main duties of the appointment will be concerned with the School Eye Service, but an opportunity will be given for the successful candidate to undertake regular work at the Bristol Eye Hospital.

Applications (12 copies), stating date of birth, qualifications and experience, together with 12 copies of 2 testimonials, and the names and addresses of 2 referees, should be sent to the Secretary of the Regional Hospital Board, 27, Tyndalls Park-road, Bristol, 8, not later than 3rd July, 1954.

CHICHESTER AND WORTHING HOSPITAL GROUPS. A Locum PHYSICAL MEDICINE PHYSICIAN is required for 5 half-days per week between 5th and 26th July at the hospitals of the Worthing and Chichester Groups. Remuneration under Medical Whitley Council terms.

Apply initially to Secretary, Chichester Group Hospital Management Committee, Royal West Sussex Hospital, Chichester.

LEEDS REGIONAL HOSPITAL BOARD. Locum Tenens CONSULTANT in Anæsthetics required for the Thoracic Unit, Castle Hill Hospital, near Hull, for a period of approximately 6 months.

Applications, stating age, qualifications and details of previous appointments, together with the names and addresses of 3 referees, should be forwarded to the Secretary to the Board, Park-parade, Harrogate.

LEEDS REGIONAL HOSPITAL BOARD. Part-time CONSULTANT (9 sessions per week) in Pathology for duties at hospitals in the Bradford Area. The person appointed to the post will be Head of the Department of Pathology in Bradford and, as such, will be required to organise the Pathological Services for the Bradford Hospitals.

Applications (12 copies), stating age, qualifications and details of appointments held showing dates, with the names and addresses of 3 referees, to the Secretary, Park-parade, Harrogate, not later than 10th July, 1954.

LIVERPOOL REGIONAL HOSPITAL BOARD. Sefton GENERAL HOSPITAL. Applications are invited for the post of Part-time ASSISTANT OPHTHALMOLOGIST giving 2 notional half-days weekly. The successful candidate will work under the direction of the Consultant Ophthalmologist. Salary will be based on the scale £1500 (at age 32)–£50–£1950.

Forms of application from and to be returned to Dr. T. Lloyd Hughes, Senior Administrative Medical Officer, Liverpool Regional Hospital Board, 19, James-street, Liverpool, 2, to be received not later than 10th July, 1954.

VINCENT COLLINGE, Secretary to the Board.

SHEFFIELD REGIONAL HOSPITAL BOARD. Locum Tenens required for CONSULTANT SURGEON, Grantham and Kesteven General Hospital, from 27th July for 3 weeks. Salary according to status.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, naming 2 referees.

SHEFFIELD REGIONAL HOSPITAL BOARD. Maximum Part-time CONSULTANT ANÆSTHETIST for the Doncaster Group of hospitals.

Application forms and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Forms to be returned by 10th July, 1954.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time ASSISTANT PSYCHIATRIST for the Middlewood Hospital, Sheffield. Salary scale £1500–£50–£1950. A house is available.

Application forms and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Forms to be returned by 17th July, 1954.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time ASSISTANT RADIOLOGIST for the City General Hospital, Sheffield (683 Beds), and the Barnsley Hospitals (Beckett 182 Beds, St. Helen 220 Beds). The City General Hospital has teaching affiliations with the University of Sheffield. There are Professorial Medical and Gynæcological Units, a Department of Thoracic Surgery, and a Regional Cardiological Centre. Salary scale £1500–£50–£1950.

Application forms and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Forms to be returned by 10th July, 1954.

SHEFFIELD. THE UNITED SHEFFIELD HOSPITALS. Applications invited from registered medical practitioners for the post of Part-time CONSULTANT PHYSICIAN to the Royal Hospital Unit for 7 national half-days per week.

Applications (16 copies), stating age, qualifications and experience, with the names of 3 referees, should be sent not later than 31st July, 1954, to the Chief Administrative Officer, The United Sheffield Hospitals, Royal Hospital, West-street, Sheffield, 1. Candidates may visit the Hospital by arrangement.

MANCHESTER REGIONAL HOSPITAL BOARD invite applications for the whole-time non-resident post of ASSISTANT PATHOLOGIST (Senior Hospital Medical Officer) to the Group Pathology Laboratory in the Bury and Rossendale Hospitals at Bury General Hospital. Successful candidate will work under general guidance of a Consultant and facilities for gaining experience in all branches of pathology are available.

Application forms from the Senior Administrative Medical Officer to the Board at Cheetwood-road, Manchester, 8, to be returned by 30th June, 1954.

SOUTH AFRICA. PROVINCIAL ADMINISTRATION OF THE CAPE OF GOOD HOPE. UNIVERSITY OF CAPE TOWN : Joint Medical Staff for Groote Schuur Hospital and other Teaching Hospitals. Vacancy :—

1. Applications are invited from registered medical practitioners for appointment to the following vacant post at the Groote Schuur Hospital, Observatory, Cape Town :—

MEDICAL PRACTITIONER (Grade D), Radiologist, Department of Radiotherapy with salary on the scale £1200–£50–£1500 p.a.

2. In addition to the scale of salary indicated a cost-of-living allowance at rates prescribed from time to time by the Administrator is payable. The present rate is £110 p.a. for single persons and £352 p.a. for married persons.

3. Conditions of service are prescribed in terms of Hospital Board Service Ordinance No. 19 of 1941, as amended, and the regulations framed thereunder.

4. The successful candidate will be appointed to the Joint Medical Staff and will be required to serve jointly the Provincial Administration of the Cape of Good Hope and the University of Cape Town.

5. Candidates must be registered specialists in the specialty in which the vacancy exists.

6. The successful candidate will be required to submit satisfactory birth and health certificates and his/her appointment will be subject to the following conditions :—

(*a*) Appointment will be on contract for 5 years in the case of a citizen of a Commonwealth country or the Republic of Ireland and 6 years in the case of a citizen of European countries other than the United Kingdom and the Republic of Ireland.

(*b*) Transport expenses (third class by rail overseas and second or cabin class steamship fare and first class by rail in the Union) necessarily incurred by the successful applicant from place of residence to the place of assumption of duty in South Africa, will be defrayed by the Administration provided that, if the contract is broken within 1 year of the date of assumption of duty the person appointed must refund to the Administration the full amount paid in respect of transport expenses and if the contract is broken within 5 years of the date of assumption of duty in the case of a Commonwealth citizen and 6 years in the case of a citizen of another European country, the person appointed shall refund to the Administration the pro rata share of the full amount above referred to in respect of the unexpired period.

(*c*) The person so appointed will be offered permanent appointment during the term of contract but not earlier than 3 years from the date of assumption of duty or with effect from the conclusion of the contract, provided he/she has passed an examination in Afrikaans as second language, which examination shall not be lower than the standard required for the Junior Certificate Examination of the Department of Education of this Province and provided further that his/her services and conduct during the period of contract are satisfactory and his/her state of health is such as will enable him/her to continue to discharge efficiently all the duties of the post in which he/she will be employed.

7. Application must be made on the prescribed form, Staff 23, which is obtainable from the Staff Clerk, Room 102, South Africa House, Trafalgar-square, London, W.C.2.

8. The completed application forms must be addressed to the Director of Hospital Services, P.O. Box 2060, Cape Town, South Africa, and must reach him not later than 31st July, 1954.

9. Candidates must state the earliest date on which they can assume duty.

SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD. Applications are invited for a post of OBSTETRICIAN AND GYNÆCOLOGIST (Consultant status) as a third member of a Unit at the Royal Infirmary of Edinburgh. The appointment will be on a basis of 4 sessions per week, and is subject to the terms and conditions of the National Health Service.

Applications, giving particulars of age, qualifications and previous experience, together with the names of 3 referees, should be submitted to the Secretary, South-Eastern Regional Hospital Board, Scotland, 11, Drumsheugh-gardens, Edinburgh, by 8th July, 1954.

SCOTLAND. NORTHERN REGIONAL HOSPITAL BOARD. Applications are invited for a whole-time post of SENIOR HOSPITAL MEDICAL OFFICER in Anæsthetics at the Stornoway Hospitals. Duties are mainly at the Lewis Hospital, where a rented house is available for the officer.

Schedules of application and further particulars are obtainable from the undersigned, with whom applications should be lodged by 17th July, 1954.

A. M. FRASER, M.D.,
Secretary and Administrative Medical Officer.
Office of the Northern Regional Hospital Board,
Raigmore, Inverness.

WELSH REGIONAL HOSPITAL BOARD. Whole-time Locum Tenens CONSULTANT SURGEON required, Merthyr General Hospital, 19th July–15th August.

Applications, naming 2 referees, to Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff.

SOUTH AFRICAN BLOOD TRANSFUSION SERVICE. Applications are invited from registered medical practitioners with experience in blood-transfusion and bacteriology for the position of SEROLOGIST of the South African Blood Transfusion Service. The appointment will be made on the salary scale £1700–£100–£2400 p.a. but, in determining the commencing salary cognisance may be taken of previous experience and special qualification. The successful applicant will be expected to assume duty in Johannesburg on 1st November, 1954. Membership of the Service's Staff Provident Fund is a condition of employment.

Applications, stating full details of age, qualifications, experience, marital status, &c., should be submitted in writing to the Secretary, South African Blood Transfusion Service, P.O. Box 9326, Johannesburg, so as to be received not later than 15th August, 1954. The Medical Director of the Service will be in London early in September, 1954, to interview applicants at a time and place to be advised.

SOUTH AFRICA. PROVINCIAL ADMINISTRATION OF THE CAPE OF GOOD HOPE. HOSPITALS DEPARTMENT. HOSPITAL BOARD SERVICE: Vacancy:—

1. Applications are invited from registered medical practitioners for appointment to the following vacant post at the Kimberley Hospital, Kimberley:—

MEDICAL PRACTITIONER (Grade E), Pathologist, with salary at the rate of £1600 p.a.

2. In addition to the salary indicated a cost-of-living allowance at rates prescribed from time to time by the Administrator is payable. The present rate is £110 p.a. for single persons and £352 p.a. for married persons.

3. Conditions of service are prescribed in terms of Hospital Board Service Ordinance No. 19 of 1941, as amended, and the regulations framed thereunder.

4. Candidates must be registered specialists.

5. The successful candidate will be required to submit satisfactory birth and health certificates and his/her appointment will be subject to the following conditions:—

(*a*) Appointment will be on contract for 5 years in the case of a citizen of a Commonwealth country or the Republic of Ireland and 6 years in the case of a citizen of European countries other than the United Kingdom and the Republic of Ireland.

(*b*) Transport expenses (third class by rail overseas and second or cabin class steamship fare and first class by rail in the Union) necessarily incurred by the successful applicant from place of residence to the place of assumption of duty in South Africa, will be defrayed by the Administration provided that, if the contract is broken within 1 year of the date of assumption of duty the person appointed must refund to the Administration the full amount paid in respect of transport expenses and if the contract is broken within 5 years of the date of assumption of duty in the case of a Commonwealth citizen and 6 years in the case of a citizen of another European country, the person appointed shall refund to the Administration the pro rata share of the full amount above referred to in respect of the unexpired period.

(*c*) The person so appointed will be offered permanent appointment during the term of contract but not earlier than 3 years from the date of assumption of duty or with effect from the conclusion of the contract, provided he/she has passed an examination in Afrikaans as second language, which examination shall not be lower than the standard required for the Junior Certificate Examination of the Department of Education of this Province and provided further that his/her services and conduct during the period of contract are satisfactory and his/her state of health is such as will enable him/her to continue to discharge efficiently all the duties of the post in which he/she will be employed.

6. Application must be made on the prescribed form, Staff 23, which is obtainable from the Staff Clerk, Room 102, South Africa House, Trafalgar-square, London, W.C.2.

7. The completed application forms must be addressed to the Director of Hospital Services, P.O. Box 2060, Cape Town, South Africa, and must reach him not later than 31st July, 1954.

8. Candidates must state the earliest date on which they can assume duty.

IRELAND. ST. JOHN OF GOD PRIVATE PSYCHIATRIC HOSPITAL, STILLORGAN, CO. DUBLIN, IRELAND. (Conducted by Brothers of St. John of God. Hospital contains 135 Beds.) Applications are invited for the position of RESIDENT MEDICAL DIRECTOR at above Hospital. Candidates should be of Consultant status and possess the highest qualifications.

Application forms with particulars sent on request. Completed forms to be returned not later than 31st August, 1954, to Brother Secretary, St. John of God Private Psychiatric Hospital, Stillorgan, co. Dublin, Ireland.

IRELAND. ST. JOHN OF GOD PRIVATE PSYCHIATRIC HOSPITAL, STILLORGAN, CO. DUBLIN, IRELAND. Applications invited immediately for position of LOCUM TENENS to the above Hospital, period of employment—3 months; renewal is not guaranteed. Qualifications—D.P.M. essential.

All inquiries directed to Brother Secretary, St. John of God Private Psychiatric Hospital, Stillorgan, co. Dublin, Ireland.

NEW ZEALAND. THE OTAGO HOSPITAL BOARD. DUNEDIN HOSPITAL AND UNIVERSITY OF OTAGO, NEW ZEALAND. Applications are invited for the position of JUNIOR PSYCHIATRIC SPECIALIST AND LECTURER IN PSYCHIATRY from those who hold a Degree in Medicine of an approved University and possess a Diploma of Psychological Medicine. The position is designated as that of Junior Specialist under the Hospital Employment (Medical Officers) Regulations, 1952, Amendment No. 1. Salary scale £NZ1290–£NZ1590 (plus cost-of-living bonus £NZ62 12s. p.a.) by annual increments of £NZ50. Commencing rate of salary according to qualifications and experience. Duties will include the teaching of psychiatry to medical undergraduates. Clinical work is carried out in the Department of Psychiatry, Dunedin Hospital, the general teaching hospital of the Medical School. The Department has 10 Beds in the general medical wards, and a 14-bedded observation and treatment ward. There are adult and child outpatient clinics. The position is a non-resident one.

Applications for this position should be made on the prescribed form obtainable from the Office of the High Commissioner for New Zealand, 415, Strand, London, W.C.2, or from THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2, who can supply further information and conditions of appointment. Applications should be in the hands of the undersigned not later than 10 A.M. on Tuesday, 31st August, 1954.

T. H. MILES, Acting Secretary.
Otago Hospital Board, P.O. Box 946, Dunedin, New Zealand.

Hospital Services: Junior Appointments

CENTRAL MIDDLESEX HOSPITAL, Park Royal, London, N.W.10. RESIDENT SENIOR HOUSE OFFICER required for Casualty Department. Successful candidate will work under supervision of Orthopædic and Traumatic Specialist. Preference given to applicant who has held resident surgical and medical posts in general hospital. Post now vacant. Appointment for 6 months subject to renewal for further 6 months.

Applications, with names of 2 referees or copies of 2 testimonials, to Medical Director by 3rd July.

CHARING CROSS HOSPITAL GROUP. Harrow HOSPITAL. Applications are invited from registered medical practitioners for the post of CASUALTY OFFICER (Junior Hospital Medical Officer or Senior House Officer grade), non-resident post, recognised for casualty training for F.R.C.S., tenable for 1 year from 1st August, 1954.

Applications should be received not later than Monday, 28th June, 1954, by FRANK HART, House Governor and Secretary to the Board, Charing Cross Hospital, W.C.2.

ELIZABETH GARRETT ANDERSON HOSPITAL, Euston-road, N.W.1. (ROYAL FREE HOSPITAL GROUP.) Applications are invited from registered Women medical practitioners for the appointment of Full-time MEDICAL REGISTRAR for General Medicine and Pædiatrics. Appointment for 1 year in the first instance, to commence 1st September, 1954. Salary in accordance with Ministry of Health scale for Registrar grades.

Applications, with names of 3 referees, should be sent to the Secretary, Elizabeth Garrett Anderson Hospital, by 10th July, 1954.

FULHAM HOSPITAL, St. Dunstan's-road, Hammersmith, W.6. FULHAM AND KENSINGTON HOSPITAL MANAGEMENT COMMITTEE. Qualified medical practitioners, including pre-registration candidates, are invited to apply for the following vacancies:—

HOUSE PHYSICIANS (3 vacancies) commencing 1st August, 1954.

HOUSE SURGEONS (2 vacancies). Appointments recognised for F.R.C.S., commencing 1st and 11th August, 1954, respectively.

Appointments are resident and limited to 6 months.

Applications to be submitted by 30th June, 1954, on forms obtainable from the Hospital Secretary. (L.196.)

GERMAN HOSPITAL, London, E.8. (General—157 Beds.) Pre-registration HOUSE SURGEON. Post vacant 1st July.

Applications, with copy testimonials, to Group Secretary, Hackney Hospital Management Committee, London, E.8, by 23rd June, quoting GH/HS.

GERMAN HOSPITAL, London, E.8. (General—157 Beds.) Pre-registration HOUSE PHYSICIAN. Post vacant 3rd July.

Applications, with copy testimonials, to Group Secretary, Hackney Hospital Management Committee, London, E.8, by 23rd June, quoting GH/HP.

HAMMERSMITH HOSPITAL AND POSTGRADUATE MEDICAL SCHOOL, Ducane-road, London, W.12. RESIDENT SENIOR HOUSE OFFICER (anæsthetics) required as soon as possible.

Applications, stating age, qualifications, experience, copies of 2 recent testimonials, to Secretary, Board of Governors, by 26th June.

HAMMERSMITH HOSPITAL AND POSTGRADUATE MEDICAL SCHOOL, Ducane-road, London, W.12. 2 Whole-time NON-RESIDENT REGISTRARS (general surgery) required.

Applications, stating age, qualifications, experience, names of 2 referees, to Secretary, Board of Governors, by 28th June.

HAMMERSMITH HOSPITAL AND POSTGRADUATE MEDICAL SCHOOL, Ducane-road, London, W.12. HOUSE SURGEON (orthopædics) required 16th August.

Applications, stating age, qualifications, experience, copies of 2 recent testimonials, to Secretary, Board of Governors, by 3rd July.

HOSPITALS FOR DISEASES OF THE CHEST. London CHEST HOSPITAL. Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER to the Tuberculosis Dispensary Clinic at the Hospital. Experience in diagnosis and treatment of tuberculosis essential.

Applications, stating age, qualifications with dates, and previous appointments held, with copies of 3 testimonials, should be sent to the undersigned by 26th June, 1954.

THOMAS BROWN, House Governor.

London Chest Hospital, E.2.

HOSPITAL FOR TROPICAL DISEASES, 4, St. Pancras-way, N.W.1. (UNIVERSITY COLLEGE HOSPITAL.) Applications are invited for post of RESIDENT MEDICAL OFFICER (Registrar grade), vacant 1st August, 1954. Salary £850–£965 p.a., less £125 p.a. residence.

Applications with names of 2 referees to Administrator and Secretary, University College Hospital, Gower-street, W.C.1, by 26th June, 1954.

LAMBETH HOSPITAL, Kennington, S.E.11. Applications are invited from pre-registration and registered medical practitioners for the position of RESIDENT HOUSE SURGEON. The appointment is for 6 months from 23rd July, 1954, and is recognised for the F.R.C.S.

Application forms may be obtained from the Physician-Superintendent at the Hospital.

MOTHERS' HOSPITAL (Salvation Army), Clapton, E.5. (Maternity—110 Beds. Recognised for M.R.C.O.G.) Applications are invited for the 12 months appointment of SENIOR HOUSE OFFICER (obstetrics) and should be sent in full detail with copy testimonials to the Group Secretary, Hospital Management Committee, Hackney Hospital, London, E.9, quoting reference MH/SHO.

NATIONAL TEMPERANCE HOSPITAL, Hampstead-road, N.W.1. Applications are invited for the post of CASUALTY OFFICER (Senior House Officer), resident or non-resident, commencing 20th July.

Applications, stating age, qualifications, experience, together with the names and addresses of 2 referees, to be forwarded to Hospital Secretary by 28th June.

NELSON HOSPITAL, Kingston-road, Merton Park, S.W.20. ST. HELIER GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications invited for appointment of SENIOR HOUSE OFFICER (Casualty Officer), vacant 1st July, 1954.

Applications, stating full particulars of experience, &c., with copies of testimonials and the name of 1 referee, should be sent to the Group Secretary, St. Helier Hospital, Carshalton, Surrey.

NORTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD.

(1) SURGICAL REGISTRAR (resident), Queen Mary's Hospital for the East End, E.15.

(2) SURGICAL REGISTRAR (resident or non-resident), Hackney Hospital, E.9. Post recognised for F.R.C.S.

(3) SURGICAL REGISTRAR, Chelmsford and Essex Hospital, Chelmsford, Essex. Furnished flat is available adjoining the Hospital premises.

(4) MEDICAL REGISTRAR (non-resident), Queen Mary's Hospital for the East End, E.15, including duties at Plaistow Hospital.

(5) Casualty Department REGISTRAR (resident), Oldchurch Hospital, Romford, Essex.

(6) E.N.T. REGISTRAR (non-resident), West Ham Group of hospitals.

(7) ANÆSTHETIC REGISTRAR (resident), Chelmsford and Essex and St. John's Hospitals, Chelmsford. Post recognised for D.A. Furnished flat available.

(8) REGISTRAR in Pulmonary Tuberculosis (resident), Harts Hospital, Woodford Green, Essex. Post offers exceptional opportunities for experience in tuberculosis and diseases of the chest. The Hospital includes Area Chest Clinic and Thoracic Surgical Unit and is easily accessible to London by tube or bus.

(9) REGISTRAR in Pulmonary Tuberculosis (resident), Ilford Isolation Hospital, Chadwell Heath, Essex. Some duties at Ilford Chest Clinic.

Appointments subject to review after 1 year.

Separate applications in duplicate, detailing date of birth, qualifications, experience, present appointment, grade and salary, with 2 copies of 2 recent testimonials, to Secretary, 11A, Portland-place, W.1, by 3rd July, 1954.

NORTH MIDDLESEX HOSPITAL AND EDMONTON CHEST CLINIC, Edmonton, N.18. SENIOR HOUSE OFFICER (tuberculosis), resident, required for 4th July, 1954. 6 months appointment with possible extension to 1 year. Duties at above Hospital and Clinic, medical and surgical, under the direction of Chest Physician and Thoracic Surgeon. Further details on request.

Applications, stating age, qualifications, experience, nationality, together with copies of recent testimonials and/or names of 2 referees, to Secretary of Hospital, immediately.

ROYAL NORTHERN HOSPITAL, Holloway, N.7. Applications are invited for the post of CASUALTY OFFICER (Senior House Officer grade), vacant 27th July, 1954. Post recognised for F.R.C.S.

Applications, enclosing copies of recent testimonials, to be sent to the Hospital Secretary by 29th June, 1954.

ROYAL NORTHERN HOSPITAL, Holloway, N.7. North WEST METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR in Radiology (X-ray Diagnostic Department). Hospital may be visited by direct appointment.

Application forms obtainable from and returnable to Secretary, Northern Group Hospital Management Committee, Royal Northern Hospital, Holloway, N.7, by 29th June, 1954.

ROYAL CANCER HOSPITAL, Fulham-road, London, S.W.3. Applications are invited for the post of MEDICAL REGISTRAR. The post, which is for 7 sessions a week, may be filled either in the grade of Registrar or alternatively in the grade of Senior Registrar by a candidate wishing to take a period of advanced training for not more than 2 years, or by a candidate holding a Consultant or Senior Hospital Medical Officer post elsewhere. For appointment as Senior Registrar candidates holding the Diploma of M.R.C.P. will be preferred. If the appointment is in the grade of Registrar some increase in the number of sessions may be considered. The duties include clinical studies of the health of staff, in support of the Hospital's Radiological Protection Service.

Applications, stating whether a Senior Registrar or Registrar post is desired, together with copies of 3 recent testimonials, should be submitted by 7th July on a form which may be obtained from the House Governor.

ST. ANN'S GENERAL HOSPITAL, N.15. (756 Beds.) Applications are invited from registered medical practitioners for the appointment of RESIDENT HOUSE PHYSICIAN (Senior House Officer) for duty in the Chest Department with other general duties, for a period of 6 months. Post vacant 1st July, 1954.

Application form from the Secretary, The Tottenham Group Hospital Management Committee, The Green, N.15.

ST. BARTHOLOMEW'S HOSPITAL, E.C.1. Applications are invited for the post of Part-time SENIOR REGISTRAR in the Cardiological Department to work 4 half-days a week at Hill End Hospital, St. Albans. The appointment will commence on 1st August, 1954.

Applications, with copies of 3 testimonials, should be submitted to the undersigned by 2nd July, 1954.

C. C. CARUS-WILSON, Clerk to the Governors.

ST. BARTHOLOMEW'S HOSPITAL, E.C.1. Applications are invited from fully registered practitioners for the post of RESIDENT MEDICAL OFFICER (House Officer grade) at the Alexandra Hospital for Children, Stockwood Park, Luton, commencing as soon as possible, for 6 months.

Applications, with copies of 3 testimonials, should be submitted to the undersigned by 2nd July, 1954.

C. C. CARUS-WILSON, Clerk to the Governors.

ST. CHARLES' HOSPITAL, Ladbroke-grove, W.10. Applications are invited for the post of SENIOR HOUSE OFFICER (thoracic surgery).

Applications, stating age, qualifications, experience, together with the names and addresses of 2 referees, to be forwarded to Hospital Secretary immediately.

ST. GEORGE'S HOSPITAL, S.W.1. Applications are invited for the post of REGISTRAR in the Department of Psychiatry. The inpatient work of the department is at the Atkinson Morley's Hospital, and the outpatient work at St. George's. The appointment is for 1 year in the first instance, and candidates will be required to take up duty as soon as possible.

Applications, giving details of age, education, experience, and the names of 2 referees, should reach the undersigned not later than 3rd July, 1954.

P. H. CONSTABLE, House Governor.

ST. JOHN'S HOSPITAL FOR DISEASES OF THE SKIN, Lisle-street, Leicester-square, London, W.C.2. Applications are invited for the appointment of Whole-time REGISTRAR, vacant 1st August. Possession of a higher qualification is desirable.

Applications, stating age, qualifications and experience, with names of 3 referees, to the Secretary, by 28th June.

ST. LEONARD'S HOSPITAL, Nuttall-street, London, N.1. (General—182 Beds.) Applications are invited from registered or provisionally registered medical practitioners for the posts of :—

HOUSE SURGEON available 16th July, 1954.

HOUSE PHYSICIAN available 30th July, 1954.

Applications, with 2 recent testimonials, to Hospital Secretary by 3rd July, 1954.

ST. MARY ABBOTS HOSPITAL, Marloes-road, Kensington, W.8. FULHAM AND KENSINGTON HOSPITAL MANAGEMENT COMMITTEE. Qualified medical practitioners are invited to apply for the following vacancies :—

HOUSE PHYSICIANS (2 vacancies). Provisionally registered candidates eligible.

HOUSE SURGEONS (2 vacancies). Provisionally registered candidates eligible. Appointments recognised for the F.R.C.S.

HOUSE SURGEON (obstetrics and gynæcology). Post recognised for the M.R.C.O.G. in Obstetrics.

Appointments commence 1st August, 1954, are resident and limited to 6 months.

Applications to be submitted by 30th June, 1954, on forms obtainable from the Hospital Secretary. (L.200.)

ST. MARY'S HOSPITAL, W.2. Applications are invited for the post of Part-time REGISTRAR to the Psychiatric Department (6 notional half-days). Previous experience in psychiatry is necessary ; preference will be given to candidates holding the D.P.M. The appointment will be for a first period of 12 months, and the successful candidate will be required to commence duties as soon as possible ; remuneration to be at Registrar rates.

Applications, stating nationality, date of birth, permanent address, qualifications with dates and details of previous and present appointments, together with the names and addresses of 3 referees, should reach ALAN POWDITCH, House Governor, not later than 30th June, 1954.

ST. MARY'S HOSPITAL, W.2. Applications are invited for the post of Part-time OUTPATIENT SURGICAL ASSISTANT (4 notional half-days per week, Wednesday A.M. and P.M., Friday P.M., and Saturday A.M.). The appointment will be for a first period of 12 months, with effect from 1st August, 1954; graded Senior House Officer.

Applications, stating nationality, date of birth, permanent address, qualifications with dates and details of previous and present appointments, together with the names and addresses of 3 referees, should reach ALAN POWDITCH, House Governor, not later than 1st July, 1954.

ST. MARY'S HOSPITAL, W.2. Applications are invited from suitably qualified registered practitioners for the post of RESIDENT ANÆSTHETIST. The appointment is for a first period of 6 months, and the successful candidate will be required to take up his duties on 10th August, 1954; remuneration to be at House Officer rates.

Applications, stating nationality, date of birth, permanent address, qualifications with dates and experience, together with the names and addresses of 3 referees, should reach ALAN POWDITCH, House Governor, not later than 1st July, 1954.

ST. STEPHEN'S HOSPITAL, Chelsea, S.W.10. House PHYSICIAN (resident) for Rheumatism Unit, vacancy 17th July. Post offers valuable experience in the study of rheumatic diseases as well as general medicine.

Applications, naming 2 referees, to Medical Superintendent immediately.

WESTMINSTER CHILDREN'S HOSPITAL. West-MINSTER HOSPITAL TEACHING GROUP. SURGICAL REGISTRAR required from 1st October, 1954. Appointment for 1 year in the first instance at salary of £850 p.a.

Applications, with copies of 3 recent testimonials, should reach the Secretary, Westminster Children's Hospital, Vincent-square, S.W.1, by 3rd July.

WESTMINSTER CHILDREN'S HOSPITAL. West-MINSTER HOSPITAL TEACHING GROUP. HOUSE SURGEON (post-registration) required for 6 months from 1st September, 1954.

Applications, with copies of testimonials, should reach the Secretary, Westminster Children's Hospital, Vincent-square, S.W.1, by 3rd July.

WESTMINSTER CHILDREN'S HOSPITAL. West-MINSTER HOSPITAL TEACHING GROUP. HOUSE PHYSICIAN (second pre-registration) required for 6 months from 1st August, 1954.

Applications, with copie of testimonials, should reach the Secretary, Westminster Children's Hospital, Vincent-square, S.W.1, by 3rd July.

WESTMINSTER HOSPITAL, St. John's-gardens, S.W.1. Applications invited for post of SURGICAL REGISTRAR for 1 year in first instance from mid-July. Candidates must hold Primary F.R.C.S.(Eng.).

Applications (6 copies), with names of 2 referees, to House Governor by 30th June.

WESTMINSTER HOSPITAL, St. John's-gardens, S.W.1. Applications invited for post of SENIOR REGISTRAR AND PATHOLOGY TUTOR to Department of Chemical Pathology for 1 year in first instance from 4th October, 1954. Candidates should have had at least 3 years experience in pathology, including some biochemistry. Duties include the biochemical investigation of hospital patients, teaching and research. Further details obtainable from Professor of Chemical Pathology.

Applications (6 copies), with names of 2 referees, to House Governor by 10th July.

WIMBLEDON HOSPITAL, Thurston-road, S.W.20. (82 Beds.) ST. HELIER GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications invited for appointment of RESIDENT HOUSE OFFICER (House Officer post—not pre-registration). Gives good general experience in acute medicine and surgery, including children.

Applications, stating full particulars of experience, &c., with copies of testimonials and the name of 1 referee, should be sent to the Secretary at Wimbledon Hospital.

ASHTON, HYDE AND GLOSSOP HOSPITAL MANAGE-MENT COMMITTEE. HOUSE PHYSICIAN required at Ashton-under-Lyne General Hospital. Preference will be given to pre-registration applicants. Post vacant mid-July.

Applications, stating age, nationality, qualifications and experience, together with copies of 3 testimonials, should be forwarded to the Group Secretary, Astley-road, Stalybridge, Cheshire, as soon as possible.

AYLESBURY. ROYAL BUCKINGHAMSHIRE AND ASSOCIATED HOSPITALS MANAGEMENT COMMITTEE.

Stoke Mandeville Hospital, Aylesbury

JUNIOR HOSPITAL MEDICAL OFFICER for National Spinal Injuries Centre. Neurological or surgical experience desirable. Vacant 1st July.

Applications, with copies of 2 recent testimonials, to the Administrative Officer.

HOUSE PHYSICIAN (Senior Resident Medical Officer) for Acute General Medical Unit, which comprises 2 Registrars and 3 Resident House Physicians. The post is of Senior House Officer grade and is vacant on 7th July.

Applications, with 3 recent testimonials, to Administrative Officer.

Tindal General Hospital, Aylesbury

HOUSE PHYSICIAN (Chest Unit), Male or Female. Pre-registration post, but registered practitioners invited to apply. Vacant 5th July, 1954. Duties include care of about 25 chest cases (including T.B. chalets), and 4 clinics weekly, including refills, forming a progressive chest unit for the Aylesbury area. Instruction in bronchoscopy and bronchography given. An acute Geriatric Unit (27 Beds), and a medical Outpatient Clinic provide general medical experience. No casualty department. Applications for Locum appointment also invited.

Please apply, with 2 testimonials, to the Administrative Officer as soon as possible.

ABERYSTWYTH. GENERAL HOSPITAL. (Hospital recognised for F.R.C.S. examination.) MID-WALES HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from newly qualified medical practitioners seeking pre-registration posts under the Medical Act, 1950, for the resident post of HOUSE SURGEON at the above Hospital. Busy General Hospital. Salary on national scale, less deduction for board and lodging.

Applications, with 2 testimonials, to the Group Secretary, Mid-Wales Hospital Management Committee, General Hospital, Aberystwyth, immediately.

ASCOT, BERKSHIRE. HEATHERWOOD ORTHO-PÆDIC HOSPITAL. (212 Beds—Adults and Children.) NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. ORTHOPÆDIC REGISTRAR (resident) required at above Hospital. Hospital is a regional centre for all general orthopædic conditions, including fractures; there is also a large amount of outpatient work. Post recognised for F.R.C.S. Candidates may visit Hospital by direct appointment.

Application forms obtainable from and returnable to the Group Secretary, Windsor Group Hospital Management Committee, Alma-road, Windsor, Berks, by 4th July.

BARNSLEY. BECKETT HOSPITAL. (182 Beds. Recog-nised for training for F.R.C.S.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time SURGICAL REGISTRAR required. Single accommodation available. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 28th June, 1954, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

BARNSTAPLE. NORTH DEVON INFIRMARY. (Central Group Hospital of 110 Beds.) HOUSE SURGEON (pre-registration) required for duty mid-July.

Applications to Group Secretary, 19, Alexandra-road, Barnstaple.

BATH CLINICAL AREA. The Board of Governors of THE UNITED BRISTOL HOSPITALS AND THE SOUTH-WESTERN REGIONAL HOSPITAL BOARD. Applications are invited by the above Boards from registered medical practitioners for 2 joint appointments of REGISTRAR in General Surgery. The appointments will be held for 1 year in the first instance, and be renewable for a further year. During the first year the successful candidates will work in the Bath Group of hospitals but may be required to undertake duties in other hospitals in the Area as circumstances require.

Applications, stating date of birth, qualifications and experience, together with the names and addresses of 2 referees, should be sent to the Secretary of the Regional Hospital Board, 27, Tyndalls Park-road, Bristol, 8, not later than 3rd July, 1954.

BATH HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for 2 posts of HOUSE ANÆSTHETIST (Senior House Officer grade) which will shortly become vacant at Royal United and St. Martin's Hospitals. Facilities for attending evening lectures, when held, at Bristol for the higher Diploma in Anæsthetics examination will be made available. Both hospitals are recognised under F.F.A.R.C.S. and D.A. regulations.

Applications, stating age, qualifications and experience, should be forwarded to J. LAWRENCE MEARS, Secretary, Manor Hospital, Bath.

BATH. ROYAL NATIONAL HOSPITAL FOR RHEU-MATIC DISEASES. Applications are invited from registered medical practitioners for post of HOUSE PHYSICIAN (Senior House Officer grade) at the above Hospital, attached to which is the Rheumatic Research Unit of South-Western and Oxford Regions. The Hospital is recognised for Part 2 of Diploma in Physical Medicine.

Applications, stating age, qualifications and experience with 3 testimonials, should be forwarded to—

J. LAWRENCE MEARS, Secretary,
Bath Hospital Management Committee.
Manor Hospital, Bath.

BATH. ROYAL UNITED HOSPITAL. Applications are invited from medical practitioners for the post of HOUSE SURGEON at the above Hospital.

Applications, stating age, qualifications and experience with 3 testimonials, should be forwarded to—

J. LAWRENCE MEARS, Secretary,
Bath Hospital Management Committee.
Manor Hospital, Bath.

BATH. ST. MARTIN'S HOSPITAL. Applications are invited from medical practitioners for post of HOUSE SURGEON (orthopædic) at above Hospital. Post offers opportunity not only in traumatic surgery but in "cold" orthopædics and specialised field of arthritic surgery. Post recognised under F.R.C.S. regulations and for pre-registration purposes.

Applications, stating age, qualifications and experience with 3 testimonials, should be forwarded to—

J. LAWRENCE MEARS, Secretary,
Bath Hospital Management Committee.
Manor Hospital, Bath.

BIRMINGHAM. ROYAL ORTHOPÆDIC HOSPITAL. (Long and short term orthopædic cases (non-traumatic)—334 Beds and extensive outpatient services.) Applications are invited from registered medical practitioners, preferably with previous orthopædic experience, for 2 SENIOR HOUSE OFFICER posts vacant shortly.

Apply, to Administrator, 80, Broad-street, Birmingham, 15.

BIRMINGHAM. ST. CHAD'S HOSPITAL, Hagley-road, BIRMINGHAM, 16. OBSTETRIC AND GYNÆCOLOGICAL HOUSE SURGEON required from 7th July, 1954. Post recognised for Pre-registration Service, and for Diploma of the R.C.O.G.

Detailed applications, with recent testimonials, to Secretary, Management Committee, Dudley Road Hospital, Birmingham, 18.

BIRMINGHAM. ST. CHAD'S HOSPITAL, Hagley-road, BIRMINGHAM, 16. ANÆSTHETIST (resident), Senior House Officer, required. Post tenable from 7th July, 1954, in the first instance for duties at the above Hospital with other duties as necessary within the Group. Recognised for the purposes of the F.F.A.R.C.S.

Detailed applications, with recent testimonials, to Secretary, Management Committee, Dudley Road Hospital, Birmingham, 18.

BIRMINGHAM. ST. CHAD'S HOSPITAL, Hagley-road, BIRMINGHAM, 16. HOUSE SURGEON required from 7th July, 1954. Post recognised for Pre-registration Service.

Detailed applications, with recent testimonials, to Secretary, Management Committee, Dudley Road Hospital, Birmingham, 18.

BIRMINGHAM ACCIDENT HOSPITAL AND REHABILITATION CENTRE, BIRMINGHAM, 15. (215 Beds.) RESIDENT HOUSE SURGEONS (Male or Female). These posts are recognised by the Royal College of Surgeons for the casualty surgery training, now compulsory for the Fellowship examinations. Appointments will be for a period of 6 months in the General Accident Service and may (at the applicants request) include a period in the 32-bedded Burns Unit. Posts are vacant immediately, including 1 for Pre-registration Service.

Applications to Administrator.

BIRMINGHAM, 18. DUDLEY ROAD HOSPITAL. (790 Beds.) HOUSE SURGEON (resident) required. Post recognised for pre-registration and F.R.C.S.(Eng.). This appointment, vacant on 10th July, 1954, is in a Unit of General Surgery of approximately 80 adult general surgical beds and 10 children's surgical beds under the control of 2 Consultant Surgeons.

Detailed applications, with copies of 3 recent testimonials, to Secretary.

BIRMINGHAM. LORDSWOOD MATERNITY HOSPITAL, Lordswood-road, HARBORNE, BIRMINGHAM, 17. RESIDENT OBSTETRIC HOUSE OFFICER, commencing mid-August, 1954. 33 Beds dealing with normal and abnormal midwifery. Recognised for D.Obst.R.C.O.G. Second period training school for pupil midwives.

Applications to the Obstetrician, not later than 1st July, 1954.

BIRMINGHAM REGIONAL HOSPITAL BOARD.

1. Birmingham (Selly Oak) Hospital Management Committee, Oak Tree-lane, Birmingham, 29

(*a*) Whole-time REGISTRAR in E.N.T. Surgery. Duties in E.N.T. Department, Selly Oak Hospital (1090 Beds, including 39 E.N.T. beds). Successful candidate will spend approximately half-time in Otological Clinics in large factories in connection with M.R.C. investigations. Non-resident. Experience specialty and higher qualification an advantage.

(*b*) SURGICAL REGISTRAR. Duties in Burns Unit in conjunction with Medical Research Council at Birmingham Accident Hospital (209 Beds). Experience in general surgery essential. Experience in plastic surgery and possession of higher surgical qualification an advantage.

2. West Bromwich and District General Hospital, Edward-street, West Bromwich

REGISTRAR in General Surgery for above Hospital (144 Beds). Recognised for F.R.C.S. Resident. Married quarters available. Higher qualification an advantage.

3. Robert Jones and Agnes Hunt Orthopædic Hospital, Oswestry (430 Beds).

REGISTRAR in Orthopædic Surgery. Higher qualification essential.

Application forms from Group Secretaries, to be returned before 5th July, 1954. Candidates may visit hospitals.

BIRMINGHAM. SOLIHULL HOSPITAL, Lode-lane, SOLIHULL. RESIDENT SURGICAL OFFICER (Senior House Officer grade). Good experience in general surgery and 5 other resident Medical staff.

Applications to Medical Superintendent.

BIRMINGHAM. SOLIHULL HOSPITAL, Lode-lane, SOLIHULL, near BIRMINGHAM. HOUSE SURGEON (pre-registration). Obstetrics. General Hospital. 5 other resident Medical staff. Post vacant now.

Applications to Medical Superintendent.

BIRMINGHAM, 13. SORRENTO MATERNITY HOSPITAL. (112 Beds, including 24 premature baby cots.) OBSTETRIC HOUSE SURGEON. Appointment recognised for D.Obst.R.C.O.G. Hospital affiliated to Birmingham Medical School for training of students. Post vacant 1st August, 1954.

Applications to Obstetrician before 30th June, 1954.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. THE CHILDREN'S HOSPITAL. ASSISTANT RESIDENT MEDICAL OFFICER required in the grade of Senior House Officer, vacant 15th August, 1954. The Officer will be required to take charge of the Infants Block (66 Cots). Previous hospital experience of diseases of infancy is desirable, and preference will be given to candidates holding the M.R.C.P.

Forms of application may be obtained from the House Governor, The Children's Hospital, Ladywood-road, Birmingham, 16, and should be returned not later than 30th June, 1954.

G. A. PHALP, Secretary to the Board of Governors.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. THE BIRMINGHAM AND MIDLAND HOSPITAL FOR WOMEN, Showell Green-lane, SPARKHILL, BIRMINGHAM, 11. Applications are invited from registered medical practitioners for the post of RESIDENT GYNÆCOLOGICAL HOUSE SURGEON for duty with the Professorial Unit, vacant 1st October, 1954. The appointment is recognised for the M.R.C.O.G.

Application forms obtainable from the House Governor at the above address, to be returned not later than 10th July, 1954.

G. A. PHALP, Secretary.

BOURNEMOUTH. ROYAL VICTORIA HOSPITAL. (490 Beds.) BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of HOUSE PHYSICIAN, vacant 4th July. The appointment is recognised for pre-registration purposes.

Applications to the Deputy Hospital Secretary at the Hospital.

BOURNEMOUTH. ROYAL VICTORIA HOSPITAL. (490 Beds.) BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of GENERAL HOUSE SURGEON, vacant 14th July, which is recognised both for the F.R.C.S. examination and for pre-registration purposes.

Applications to the Deputy Hospital Secretary at the Hospital.

BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. ROYAL VICTORIA HOSPITAL, Poole-road, WESTBOURNE, BOURNEMOUTH. Applications are invited for the appointment of HOUSE SURGEON for E.N.T. and ophthalmic duties, vacant 18th July, 1954. In addition to duties at the above Hospital, the successful candidate will be required to assist in the E.N.T. outpatient clinics at the Royal Victoria Hospital, Shelley-road, Boscombe, and the Poole General Hospital. The appointment is recognised for the D.O. and D.L.O. Diplomas but not for pre-registration purposes.

Applications to the Deputy Hospital Secretary, Royal Victoria Hospital, Shelley-road, Boscombe, Bournemouth.

BOURNEMOUTH (near). CHRISTCHURCH HOSPITAL, CHRISTCHURCH, HANTS. BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. HOUSE PHYSICIAN required for General Medicine, post vacant 2nd August, 1954. The Hospital comprises 61 acute medical beds, 188 chronic sick, 34 pædiatric and 6 chest diagnostic.

Applications, with copies of testimonials, to the Group Secretary, Hospital Management Committee Office, Royal Victoria Hospital, Gloucester-road, Boscombe, Bournemouth.

BEDFORD GENERAL HOSPITAL. (437 Beds.) Resident HOUSE SURGEON (pre-registration) required immediately. The appointment offers exceptional opportunity for general experience in a busy acute Surgical Unit.

Applications, stating age, nationality, qualifications, previous appointments, together with copies of 2 testimonials, should be forwarded to Group Secretary, Bedford Group Hospital Management Committee, 3, Kimbolton-road, Bedford.

BEDFORD GENERAL HOSPITAL. (437 Beds.) North WEST METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR required for busy acute Orthopædic and Traumatic Department at above Hospital. Previous orthopædic experience desirable. Candidates may visit Hospital by appointment with Group Secretary.

Application forms obtainable from, and returnable to, Group Secretary, Bedford Group Hospital Management Committee, 3, Kimbolton-road, Bedford, as soon as possible.

BEDFORD GENERAL HOSPITAL. (437 Beds.) Locum REGISTRAR required for busy acute Orthopædic and Traumatic Department for approximately 2 months. Previous orthopædic experience desirable.

Applications, stating age, nationality, qualifications, previous appointments, together with copies of 2 recent testimonials, should be forwarded to Group Secretary, Bedford Group Hospital Management Committee, 3, Kimbolton-road, Bedford.

BLACKBURN (near). CALDERSTONES HOSPITAL FOR MENTAL DEFECTIVES, WHALLEY, near BLACKBURN. (2300 Beds.) CALDERSTONES HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for appointment of Locum JUNIOR HOSPITAL MEDICAL OFFICER at the above Hospital. Salary £16 per week, with deductions for board and lodging.

Applications, with names of 3 referees, to the Medical Superintendent at the Hospital, as soon as possible.

BLACKBURN AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the following posts which fall vacant around beginning of July, 1954 :—

Victoria Hospital, Accrington (112 acute beds)
SENIOR HOUSE OFFICER (medicine).
HOUSE PHYSICIAN.
HOUSE SURGEON.

Queen's Park Hospital, Blackburn (644 general beds)
HOUSE PHYSICIAN.

All House Officer posts recognised for pre-registration purposes. House Surgeon post recognised for F.R.C.S.

Apply to Secretary of the Committee, Royal Infirmary, Blackburn.

BLACKBURN AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (anæsthetics) required. Residence and duties mainly at Queen's Park Hospital, Blackburn, with sessions at the Blackburn Royal Infirmary and Accrington Victoria Hospital as arranged by the Consultant Anæsthetist. Post recognised for D.A. and F.F.A.R.C.S.

Apply to Secretary of the Committee, Royal Infirmary, Blackburn.

BLACKPOOL. GLENROYD MATERNITY HOSPITAL. (60 Beds.) BLACKPOOL AND FYLDE HOSPITAL MANAGEMENT COMMITTEE. HOUSE OFFICER (obstetrics), resident, vacant 8th August, 1954.

Applications, together with names of referees, should be sent to the Group Secretary, Blackpool and Fylde Hospital Management Committee, Victoria Hospital, Blackpool.

BRIGHTON. NEW SUSSEX HOSPITAL FOR WOMEN, Windlesham-road. HOUSE PHYSICIAN (Female) for a period, of 6 months from 9th August, 1954. Pre-registration candidates may apply.

Applications, stating age, nationality, qualifications and experience, together with copies of recent testimonials, to the Administrative Officer as soon as possible.

BRIGHTON. ROYAL SUSSEX COUNTY HOSPITAL. (300 Beds.) Applications are invited for the following posts :—

HOUSE SURGEON. Pre-registration and recognised for F.R.C.S.

CASUALTY HOUSE SURGEON (1 of 3). Duties include work in Orthopædic and Traumatic Unit. Pre-registration and recognised for F.R.C.S.

Both vacant mid-July.

Applications, stating age, qualifications and experience, naming 2 referees, to be sent to the Administrative Officer.

BRIGHTON. ROYAL SUSSEX COUNTY HOSPITAL. (300 Beds.) JUNIOR HOSPITAL MEDICAL OFFICER required immediately as Senior Casualty Officer. Salary £700–£50–£1000.

Applications, stating previous posts held, together with names of 2 referees, to the Administrative Officer.

BRIGHTON GENERAL HOSPITAL. House Surgeon to the General Surgical Unit (60 Beds), recognised for F.R.C.S. The post will be vacant about 23rd July, 1954. The post is recognised as a pre-registration appointment.

Applications, stating age, qualifications, experience and giving the names of 2 referees, should be sent to the Physician-Superintendent, Brighton General Hospital, Elm-grove, Brighton, 7.

BRADFORD ROYAL INFIRMARY. House Officer (anæsthetics), vacant now. Recognised for D.A. and F.F.A. R.C.S. Opportunities for plastic and intra-thoracic experience. Salary £425–£525 p.a., less £125 p.a. residential emoluments.

Applications, stating age, nationality, qualifications and experience, with copy testimonials, to Secretary.

BRADFORD. ST. LUKE'S HOSPITAL. House Officer (anæsthetics), vacant now. Recognised for D.A. and F.F.A. R.C.S. Opportunities for plastic and intra-thoracic experience. Salary £425–£525 p.a., less £125 p.a. residential emoluments.

Applications, stating age, nationality, qualifications and experience, with copy testimonials, to Secretary, Bradford Royal Infirmary.

BRISTOL. COSSHAM/FRENCHAY HOSPITAL MANAGEMENT COMMITTEE. FRENCHAY HOSPITAL. (513 staffed beds, expanding.) Applications are invited for the post of SENIOR HOUSE OFFICER in the regional Neurosurgery Department, vacant 1st August, 1954. This post offers useful surgical experience and the opportunity of gaining a working knowledge of neurological diagnosis.

Applications to the Secretary, Frenchay Hospital, quoting "N.S.F." Names of 2 referees required.

BRISTOL. COSSHAM/FRENCHAY HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of a Male JUNIOR ASSISTANT VENEREOLOGIST (non-resident). The duties of the successful candidate will be primarily in connection with V.D. He will be attached to Frenchay Hospital and in addition will be required to undertake duties in the various Bristol area clinics. Previous experience in venereology an advantage. The appointment will be subject to the National Health Service superannuation regulations and terms and conditions for hospital medical staff. Salary scale £700–£50–£1000 p.a.

Applications, with full particulars of age, qualifications and experience, and the names and addresses of 3 referees, should reach the Secretary, Frenchay Hospital, Bristol, not later than 3rd July, 1954.

BRISTOL. THE BOARD OF GOVERNORS OF THE UNITED BRISTOL HOSPITALS AND THE SOUTH-WESTERN REGIONAL HOSPITAL BOARD. Applications are invited by the above Boards from registered medical practitioners for the joint appointment of REGISTRAR to the South West Regional Blood Transfusion Centre at Southmead, Bristol. The appointment, which is non-resident, will be held for 1 year. Duties include serological and hæmatological work in the laboratories, clinical work at Southmead Hospital, and attendance at blood-collecting sessions. Facilities are provided for participation in research. Previous experience of Blood Bank work in a hospital Pathological Department is essential.

Applications, stating date of birth, qualifications and experience, together with the names and addresses of 2 referees, should be sent to the Secretary of the Regional Hospital Board, 27, Tyndalls Park-road, Bristol, 8, not later than 3rd July, 1954.

BROMLEY HOSPITAL, Bromley, Kent. Senior House OFFICER in charge of Casualty Department required 1st July. Facilities to widen experience with the surgical firms of the Hospital. Appointment for 6 or 12 months. Deduction for residence £150 p.a.

Apply, stating age, qualifications with dates, previous experience, and naming 3 referees, to Administrative Officer.

BOLTON AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE.

JUNIOR HOSPITAL MEDICAL OFFICER to assist at Bolton Chest Clinic and have clinical charge of small sanatorium of 59 Beds under the direction of the Consultant. Salary scale £775–£50–£1075.

Bolton District General Hospital (604 Beds, including 109 for obstetrics and 30 for gynæcology)

RESIDENT SENIOR HOUSE OFFICER for the Department of Obstetrics and Gynæcology. Tenable for 12 months. Hospital recognised for M.R.C.O.G. and D.Obst.R.C.O.G.

Applications, stating age, nationality, qualifications, experience, and the names of 2 referees, should be sent immediately to—

H. P. TRAVIS, Group Secretary.

The Royal Infirmary, Bolton.

CARLISLE. CUMBERLAND INFIRMARY. (340 Beds.) HOUSE OFFICER (general surgery) required immediately for period of 6 months or Locum for shorter period. This post is recognised for the F.R.C.S. examination, and pre-registration practitioners are eligible to apply.

Applications, with 2 names for reference, to be sent to the Secretary.

CAMBRIDGE. FULBOURN HOSPITAL. Senior House OFFICER (resident or non-resident). Previous psychiatric experience not required. This Hospital of 976 Beds is linked with the Cambridge University Department of Psychology and Addenbrooke's Hospital, and provides a basic psychiatric training leading to the D.P.M.

Applications, stating age, qualifications and experience, with names of 2 referees, should be sent to—

Dr. D. H. CLARK, Medical Superintendent.

Fulbourn Hospital, near Cambridge.

CAMBRIDGE. ADDENBROOKE'S HOSPITAL. Locum MEDICAL REGISTRAR required for 3 months from 1st July.

Apply, with full particulars and 3 recent references, to Secretary, by 25th June. Interviews 30th June, 1954.

CAMBRIDGE. ADDENBROOKE'S HOSPITAL. House OFFICER (Orthopædic Department), for 6 months from 1st August, 1954. Recognised Pre-registration Service.

Apply, stating age, nationality, qualifications and experience with dates, and copies of 3 testimonials, to Secretary by 26th June. Interviewing 3rd July.

CARDIFF. ROYAL HAMADRYAD GENERAL AND SEAMEN'S HOSPITAL. CARDIFF HOSPITAL MANAGEMENT COMMITTEE. RESIDENT SENIOR HOUSE OFFICER (surgical) required. Post covers 44 surgical beds under the care of Consultants from Cardiff Teaching Hospitals.

Form of application from Group Secretary, Cardiff Hospital Management Committee, 44, Cathedral-road, Cardiff.

CARDIFF. ST. DAVID'S HOSPITAL. (656 Beds.) CARDIFF HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (non-resident) required in Casualty Department to commence immediately.

Application form from Group Secretary, Cardiff Hospital Management Committee, 44, Cathedral-road, Cardiff.

CARDIFF. ST. DAVID'S HOSPITAL. (656 Beds.) MATERNITY UNIT (118 Beds). CARDIFF HOSPITAL MANAGEMENT COMMITTEE. RESIDENT SENIOR HOUSE OFFICER in Obstetrics required. Regular undergraduate teaching takes place and post recognised for M.R.C.O.G. and D.Obst.R.C.O.G. Appointment for 1 year commencing 1st August, 1954.

Form of application from Group Secretary, Cardiff Hospital Management Committee, 44, Cathedral-road, Cardiff.

CARDIFF. ST. DAVID'S HOSPITAL. (656 Beds.) CARDIFF HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (resident or non-resident) required immediately for Geriatric Unit (200 Beds).

Form of application from Group Secretary, Cardiff Hospital Management Committee, 44, Cathedral-road, Cardiff.

CHELMSFORD AND ESSEX HOSPITAL. (161 Beds.) Applications are invited for the post of RESIDENT HOUSE SURGEON (pre-registration post). The post will become vacant on 24th July and offers good surgical experience and is recognised for the F.R.C.S.

Applications, together with 2 recent testimonials, to the Secretary, Chelmsford Hospital Management Committee, London-road, Chelmsford.

CHELTENHAM GENERAL AND EYE HOSPITAL. (170 Beds.) HOUSE SURGEON (pre-registration) required early July.

Applications, stating age, experience, and names of 3 referees, to be sent to the Group Secretary, General Hospital, Cheltenham.

CHELTENHAM GENERAL AND EYE HOSPITAL. (170 Beds.) RESIDENT SENIOR HOUSE OFFICER (casualty) required.

Applications, giving details of qualifications and experience and names of 3 referees, to the Group Secretary, Sandford-road, Cheltenham.

CHELTENHAM GENERAL, EYE AND CHILDREN'S HOSPITAL. (CHILDREN'S DEPARTMENT.) Applications are invited for the post of RESIDENT MEDICAL OFFICER (Senior House Officer grade), for the Children's Department (54 Beds). The appointment which is recognised for candidates entering for the D.C.H. offers scope for wide experience in all Departments of Pædiatrics, surgical cases and attendance at Outpatient Departments at the General Hospital. Previous hospital experience in pædiatrics is desirable.

Applications, together with copies of 3 testimonials, should be addressed to S. T. DAVIS, Group Secretary.

General Hospital, Cheltenham.

CHEPSTOW, MONMOUTHSHIRE. ST. LAWRENCE HOSPITAL. (150 Beds.) PLASTIC SURGERY, JAW INJURIES AND BURNS CENTRE. SENIOR HOUSE OFFICER (resident) in Plastic Surgery required. Previous experience in specialty not essential. The successful candidate will receive a thorough training in plastic surgery and burns. Hospital intakes from most of Wales and post provides extensive experience. Salary £745, less £150 for board-residence.

Write, quoting 2 referees, to Group Secretary, 64, Cardiff-road, Newport, Mon.

CROYDON GENERAL HOSPITAL. (200 Beds.) Surgical HOUSE OFFICER (pre-registration post) required as from 13th July.

Application forms obtainable from GEORGE A. PAINES, Group Secretary, Hospital Management Committee, General Hospital, Croydon, to be returned immediately.

CROYDON GENERAL HOSPITAL. (200 Beds.) House PHYSICIAN (pre-registration post) required as from 15th July.

Application forms obtainable from GEORGE A. PAINES, Group Secretary, Hospital Management Committee, General Hospital, London-road, Croydon, to be returned immediately.

CROYDON GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. ANÆSTHETIC REGISTRAR (whole-time) for Group required immediately. Duties mainly at Croydon General Hospital (200 Beds) and Mayday Hospital (618 Beds). Candidates must have experience in anæsthetics and possession of D.A. an advantage. Both Hospitals recognised for F.F.A.R.C.S. and D.A.

Application forms obtainable from GEORGE A. PAINES, Group Secretary, Hospital Management Committee, General Hospital, Croydon.

CROYDON. MAYDAY HOSPITAL. (618 Beds.) House SURGEON (pre-registration) for period of 6 months from 1st July.

Application forms obtainable from GEORGE A. PAINES, Group Secretary, Hospital Management Committee, General Hospital, Croydon, to be returned immediately.

CHESTERFIELD ROYAL HOSPITAL. (324 Beds.) CHESTERFIELD HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for appointments of 2 HOUSE SURGEONS at the above Hospital. The posts, which are recognised for Pre-registration Service, become vacant early in July. Salary £425, £475, or £525 p.a. according to experience, less £125 p.a. for residential emoluments.

Please apply in detail to M. H. BOONE, Secretary, from whom particulars of the Hospital are obtainable.

CHICHESTER GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. RESIDENT MEDICAL REGISTRAR required 1st September for duty primarily at Royal West Sussex Hospital, Chichester (202 Beds), with care, under Consultant Physicians, of 60 adult medical and 10 children's beds; also assisting Dermatologist and Physical Medicine Physician. There is a House Physician. Appointment subject to current MDB Whitley Council terms and superannuation regulations. Salary £850 first year, £965 second, each less £150 for residence. Candidates may visit Hospital. Canvassing disqualifies.

Forms, obtainable from Group Secretary at Hospital, to be submitted within 14 days.

CHICHESTER. ROYAL WEST SUSSEX HOSPITAL. (202 acute beds.) RESIDENT HOUSE SURGEON required for 6 months appointment. National salary scale for first, second, or third posts. Post approved for pre-registration practitioners. Post recognised for F.R.C.S. 6 residents including Resident Surgical Officer and 3 House Surgeons. Vacant from middle of July.

Apply to the Senior Administrative Officer.

CHICHESTER. ST. RICHARD'S HOSPITAL. Chichester GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of CASUALTY AND ADMISSION OFFICER (Senior House Officer grading and non-resident). This post is recognised under the F.R.C.S. regulations. Post vacant 1st July. Salary in accordance with national scale.

Full particulars, together with names of 3 referees, should be addressed to the Surgeon-Superintendent as soon as possible.

COLCHESTER GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications invited for the following post:—

Essex County Hospital, Colchester (189 Beds)

HOUSE OFFICER (surgical). First, second, third, or pre-registration post; tenable for 6 months.

Applications, with copies of 3 testimonials, should be forwarded to the Group Secretary, Colchester Hospital Management Committee, 14, Pope's-lane, Colchester.

COLCHESTER GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications invited for the following post:—

Black Notley Hospital, Braintree, Essex (544 Beds)

SENIOR HOUSE OFFICER to Pulmonary Tuberculosis Unit (187 Beds). Post tenable for 1 year.

Applications, with copies of 3 testimonials, should be sent to the Group Secretary, 14, Pope's-lane, Colchester, Essex.

COLCHESTER GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications invited for the following posts:—

Clacton and District Hospital, Clacton-on-Sea (58 Beds)

SENIOR HOUSE OFFICER (Resident Surgical Officer). Post tenable for 1 year.

SENIOR HOUSE OFFICER (Resident Casualty Officer) required temporarily during summer months to mid-September.

Applications, with copies of 3 testimonials, should be forwarded to the Group Secretary, 14, Pope's-lane, Colchester, Essex.

CROMER AND DISTRICT HOSPITAL, Norfolk. Applications are invited for the post of RESIDENT MEDICAL OFFICER (Senior House Officer status). Post vacant August, 1954, at a salary of £745 p.a., in accordance with conditions of service issued by the Ministry of Health. This is a busy general hospital of 50 Beds which has a Pre-convalescent Annexe, of 64 Beds and an Outpatient Department where Consultants in all the major specialties hold regular sessions. The appointment thus offers practical experience of an all round kind particularly useful to those contemplating entry into general practice. Residential accommodation available or furnished flat for married man.

Applications, stating age, qualifications, experience, sex, and the names of 2 referees, should be addressed to the Secretary, Cromer Area Hospital Management Committee, Cliff-avenue, Cromer.

DARLINGTON MEMORIAL HOSPITAL. (210 Beds.) DARLINGTON DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of HOUSE SURGEON (resident) which post is recognised for the F.R.C.S. (Eng.). Salary in accordance with national scale.

Apply, giving age and references, to the undersigned forthwith.

G. W. BECKWITH, Group Secretary.

DERBY. CITY HOSPITAL. House Surgeon (pre-registration) or SENIOR HOUSE OFFICER, vacant June.

Applications, stating full details, together with copies of 2 recent testimonials, should be sent to the Medical Superintendent.

DERBY. DERBYSHIRE ROYAL INFIRMARY. House PHYSICIAN (pre-registration), vacant 1st August, 1954.

Applications, with copies of 2 testimonials, should be sent to Secretary.

DERBY. DERBYSHIRE ROYAL INFIRMARY. Senior HOUSE OFFICER (anæsthetics), vacant 1st September, 1954. Recognised for D.A.

Applications, stating ful particulars with copies of 2 testimonials, to be sent as soon as possible to the Secretary at the Infirmary.

DERBY. DERBYSHIRE ROYAL INFIRMARY. House SURGEON (pre-registration) or SENIOR HOUSE OFFICER, General Surgery.

Applications, stating full particulars, with copies of 2 testimonials, to be sent as soon as possible to the Secretary at the Infirmary.

DEWSBURY. STAINCLIFFE GENERAL HOSPITAL. (314 Beds.) RESIDENT SURGICAL OFFICER (Senior House Officer grade), vacant now. The Surgical Unit comprises 66 Beds, and the Hospital is recognised for the F.R.C.S.

Applications, giving full details to the Administrative Officer at the Hospital, quoting reference "L."

DEWSBURY. STAINCLIFFE GENERAL HOSPITAL. (314 Beds.) HOUSE OFFICER (general medicine and pædiatrics), first, second, or third post, vacant 1st August, 1954, and tenable for 6 months. Recognised pre-registration appointment. Hospital has 68 adult acute medical and 34 pædiatric beds. It is recognised for the D.C.H.

Applications, with full particulars, to the Administrative Officer at the Hospital, quoting Ref. (L).

DORCHESTER. DORSET COUNTY HOSPITAL. (113 Beds.) HOUSE SURGEON required (Male or Female), post vacant early July and tenable for 6 months. Recognised for F.R.C.S. examination and approved for Pre-registration Service.

Applications, stating age, experience, qualifications and nationality, together with copy testimonials, to Group Secretary, West Dorset Group Hospital Management Committee, Damers-road, Dorchester, immediately.

DUDLEY, STOURBRIDGE AND DISTRICT HOSPITAL GROUP. BIRMINGHAM REGION. Applications invited from registered practitioners for following appointments:—

The Guest Hospital, Dudley (154 Beds)

SENIOR HOUSE OFFICER (resident), casualty. Post now vacant. Salary £670 p.a., less £150 p.a. in respect of residential emoluments.

SENIOR HOUSE OFFICER (Anæsthetist). Post vacant 5th July.

HOUSE OFFICER (surgical), pre-registration, vacant July.

HOUSE OFFICER (medical), pre-registration, vacant July.

Corbett Hospital, Stourbridge (106 Beds)

SENIOR HOUSE OFFICER (resident), casualty. Post now vacant. Salary £670 p.a., less £150 p.a. in respect of residential emoluments.

HOUSE OFFICER (surgical), pre-registration, vacant July.

HOUSE OFFICER (medical), pre-registration, vacant June.

Wordsley Hospital, near Stourbridge (478 Beds)

SENIOR HOUSE OFFICER (resident), Anæsthetist. Post now vacant. Salary £670 p.a., less £150 p.a. in respect of residential emoluments. In addition to general surgery, experience is available in gynæcology and there is a major Orthopædic Unit. Regional Plastic Surgery Unit at this Hospital.

Prestwood Sanatorium, near Stourbridge

JUNIOR HOSPITAL MEDICAL OFFICER (resident) at above Sanatorium, which consists of 200 Beds at Prestwood, 35 at Edge View and 60 at The Limes, and is for pulmonary tuberculosis. Post now vacant.

Applications, stating age, experience, with copies of 3 recent testimonials, to Group Secretary, The Guest Hospital, Dudley, Worcs.

EAST CUMBERLAND HOSPITAL MANAGEMENT COMMITTEE. Appointment of House Officers. Applications are invited for the following appointments:—

Cumberland Infirmary, Carlisle (340 Beds)

1 HOUSE OFFICER ("Specials"—E.N.T. and Eyes).

1 SENIOR HOUSE OFFICER (orthopædics).

Applications, with names of 2 referees, should be forwarded immediately to the Secretary, East Cumberland Hospital Management Committee, Cumberland Infirmary, Carlisle.

EDGWARE GENERAL HOSPITAL, Edgware, Middlesex. (715 Beds.) RESIDENT PÆDIATRIC HOUSE PHYSICIAN for above Hospital. Post vacant 27th July, 1954. Salary according to experience. 6 months appointment.

Applications, stating age, qualifications, experience, and enclosing copies of up to 3 recent testimonials, to Medical Director of Hospital by 3rd July, 1954. Candidates selected for interview will be notified by 10th July, 1954.

EDINBURGH. GOGARBURN INSTITUTION BOARD OF MANAGEMENT. Applications are invited for the post of HOUSE OFFICER. The Institution is a recognised training school for the D.P.M., offers scope for wide experience in all branches of mental deficiency and child psychiatry, and is attached to Edinburgh University for teaching purposes. Accommodation available for unmarried person only.

Applications to the Physician-Superintendent, Gogarburn Hospital, Corstorphine, Edinburgh, 12.

ENFIELD, MIDDLESEX. CHASE FARM HOSPITAL. ENFIELD GROUP HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (non-resident post) for casualty duties required immediately. Recognised by Royal College of Surgeons for the Final Fellowship examination. 12 months appointment. Hours: 9 A.M.–5.30 P.M. Monday–Friday; 9 A.M.–1 P.M. Saturday.

Applications, with the names and addresses of 2 referees, to the Secretary of the Management Committee at Chase Farm Hospital.

EPSOM, SURREY. WEST PARK HOSPITAL (for all stages of nervous and mental disorders). WEST PARK HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for 3 appointments of REGISTRAR in Psychiatry at above Hospital. Candidates may be of either sex. Single residential quarters are available.

Applications (5 copies) should be made on forms to be obtained from the Secretary to the Hospital Management Committee at the Hospital, to whom they should be returned not later than 2nd July.

FARNBOROUGH HOSPITAL, Farnborough, Kent. (General—800 Beds.) RESIDENT SENIOR HOUSE OFFICER required for a busy E.N.T. Department with 4 specialist operating sessions, 5 outpatient clinics and a diagnostic Hearing-Aid Centre. Recognised for D.L.O. and offers valuable experience in all aspects of E.N.T. work.

Apply, stating age, qualifications and experience, and naming 2 referees, to the Administrative Officer.

FARNBOROUGH HOSPITAL, Farnborough, Kent. (800 Beds.) ORTHOPÆDIC SENIOR HOUSE OFFICER required immediately for 6 months. Deduction for residence £150.

Apply, stating age, qualifications with dates, experience, and naming 3 referees, to the Administrative Officer.

GRIMSBY GENERAL HOSPITAL. (226 Beds.) Grimsby HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER for Orthopædic, Fracture and Accident Service. Previous surgical and orthopædic experience would be an advantage. Post recognised for F.R.C.S. Excellent Medical Library facilities.

Applications should be sent immediately to the Hospital Secretary, Grimsby General Hospital.

GRIMSBY GENERAL HOSPITAL. (226 Beds.) Grimsby HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER (gynæcological), Male or Female, for duties at the above-named Hospital and Scartho Road Infirmary, Grimsby. A Locum appointment would be considered.

Applications, with the names of 2 referees, to Hospital Secretary, Grimsby General Hospital.

GUILDFORD. ROYAL SURREY COUNTY HOSPITAL. (232 Beds.) SENIOR HOUSE OFFICER for Neurology and Ophthalmology required. Post is vacant on 17th July and resident accommodation is available. Tenable for 6 months, renewable. It is recognised both for F.R.C.S. and D.O.

Apply as soon as possible, with copies of 3 testimonials, to Hospital Secretary.

GUILDFORD. ROYAL SURREY COUNTY HOSPITAL. (232 Beds.) RESIDENT SENIOR HOUSE OFFICER required 1st July, for E.N.T. Department. Tenable for 6 months, renewable. Post recognised for F.R.C.S. and D.L.O. examinations.

Applications, with copies of 3 testimonials, should be sent to the Hospital Secretary as soon as possible.

GUILDFORD. ST. LUKE'S HOSPITAL. (392 Beds.) Locum OBSTETRIC AND GYNÆCOLOGICAL REGISTRAR required for period 28th June–11th July inclusive (57 obstetric beds, 33 gynæcological beds).

Applications, with full details and copies of 2 testimonials, to Physician-Superintendent at Hospital.

HEMEL HEMPSTEAD, HERTFORDSHIRE. WEST HERTS HOSPITAL. (167 Beds. 5 residents.) RESIDENT CASUALTY OFFICER (Junior Hospital Medical Officer) required. Post now vacant.

Applications, giving full details and 2 names for reference, should be sent to the Hospital Secretary.

HERTFORD COUNTY HOSPITAL. (171 Beds. Hospital situated 21 miles from London.) CASUALTY OFFICER (Male or Female), third post held, with attachment to Pædiatrician and Ophthalmic Consultant. Salary £450 p.a., less £100 p.a. residential emoluments. Recognised under F.R.C.S. regulations. Appointment to commence 21st June, 1954.

Apply, with full details and references, to Secretary, Hertford County Hospital, Hertford, Herts.

HASTINGS. ST. HELEN'S HOSPITAL. (497 Beds.) HOUSE PHYSICIAN (resident) for Pædiatrics and General Medicine. National scale of salary. Post vacant now.

Apply to Hospital Administrator.

HASTINGS. ROYAL EAST SUSSEX HOSPITAL. (150 Beds.) SENIOR HOUSE OFFICER (casualty and orthopædic). Post vacant 1st August. National scale of salary.

Apply to Hospital Administrator.

HAVERFORDWEST. PEMBROKE COUNTY WAR MEMORIAL HOSPITAL. (163 Beds.) WEST WALES HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the resident post of SENIOR HOUSE OFFICER for general surgical duties at the above Hospital. Salary in accordance with the approved scales—viz., £745 p.a., less £145 p.a. for residential emoluments.

Applications, stating age, qualifications, experience and nationality, with names and addresses of 3 referees, to Group Secretary, West Wales Hospital Management Committee, Glangwili, Carmarthen.

HAVERFORDWEST. PEMBROKE COUNTY WAR MEMORIAL HOSPITAL. (163 Beds. Recognised by the Royal College of Surgeons and for Pre-registration Service.) WEST WALES HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of RESIDENT HOUSE OFFICER (surgical). Salary £425, £475 and £525 p.a., according to experience (plus special grant of £50 p.a.), less £125 p.a. for residential emoluments.

Applications, stating age, qualifications, experience and nationality, with names and addresses of 3 referees, to Group Secretary, West Wales Hospital Management Committee, Glangwili, Carmarthen.

HALIFAX GENERAL HOSPITAL. (425 Beds.) House SURGEON required. Approved pre-registration appointment. Post vacant July.

Applications to the Group Secretary, Royal Halifax Infirmary, Halifax.

HALIFAX GENERAL HOSPITAL. House Physician required for Pædiatric Unit of 35 Beds. Approved pre-registration appointment and recognised for D.C.H. Post vacant July.

Applications to the Group Secretary, Royal Halifax Infirmary, Halifax.

HALIFAX. ST. JOHN'S HOSPITAL. Applications are invited for the post of SENIOR HOUSE OFFICER at the above Hospital which has 382 Beds for geriatric cases and chronic sick patients. Good facilities for modern method of treating geriatric cases. Pathological Laboratory; Physiotherapy and Occupational Therapy Departments situated at the Hospital.

Applications to the Group Secretary, Royal Halifax Infirmary, Halifax.

HALIFAX. ROYAL HALIFAX INFIRMARY. (301 Beds.) HOUSE SURGEON required. Approved pre-registration appointment.

Applications to Group Secretary, Royal Halifax Infirmary, Halifax.

HALIFAX. ROYAL HALIFAX INFIRMARY. (301 Beds.) SENIOR HOUSE OFFICER in General Surgery required. Post vacant late July.

Applications to Group Secretary, Royal Halifax Infirmary, Halifax.

HILLINGDON HOSPITAL, near Uxbridge, Middlesex. HOUSE SURGEON (resident), for obstetric duties at above Hospital. Previous obstetrics experience desirable but not essential. Post recognised for D.Obst.R.C.O.G. and M.R.C.O.G. Post vacant end July.

Apply, stating age, nationality, qualifications, experience and enclosing copies of not more than 3 recent testimonials, to Medical Director by 28th June.

HOUNSLOW HOSPITAL, Staines-road, Hounslow, MIDDLESEX. (81 Beds—General Acute.) NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. RESIDENT SURGICAL REGISTRAR required for 1 year in the first instance, recognised for F.R.C.S. Post now vacant. Candidates may visit the Hospital by direct appointment with the Hospital Secretary.

Application forms obtainable from, and returnable to, the Secretary, Staines Group Hospital Management Committee, Ashford Hospital, London-road, Ashford, Middlesex, not later than 29th June, 1954.

HOVE GENERAL HOSPITAL, Sussex. House Surgeon AND CASUALTY OFFICER (recognised for F.R.C.S.) required as soon as possible. Salary £525, less £125 p.a. for residential emoluments.

Applications, stating age, qualifications, experience and naming 2 referees, to the Administrative Officer.

HUDDERSFIELD ROYAL INFIRMARY. (312 Beds.) HUDDERSFIELD HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEON required, to commence duty immediately. The post is recognised as a pre-registration appointment. Salary in accordance with national scale.

Applications, together with copies of 3 recent testimonials, to be addressed to the undersigned as soon as possible.

H. J. JOHNSON, Secretary to the Management Committee.
The Royal Infirmary, Huddersfield.

HUDDERSFIELD HOSPITAL MANAGEMENT COM-MITTEE. Applications are invited from provisionally registered or registered medical practitioners for the post of HOUSE SURGEON to the Princess Royal Maternity Home (57 Beds), to commence duty on 1st August, 1954. The holder of the post, which is recognised for the D.Obst.R.C.O.G., will have access to the abnormal maternity and gynæcological beds at The Royal Infirmary. The Department is under the control of 2 Consultant Obstetricians and Gynæcologists. Salary in accordance with national scale.

Applications to be addressed to—

H. J. JOHNSON, Secretary to the Management Committee.
The Royal Infirmary, Huddersfield.

HULL. KINGSTON GENERAL HOSPITAL. (447 Beds.) Applications are invited for the post of RESIDENT SENIOR HOUSE SURGEON (recognised for the F.R.C.S. examinations). There are 69 general surgical beds and some supervision is required of 17 gynæcological beds. Salary £745, less emoluments. Post now vacant.

Applications, with names of referees, to the Secretary, Hull A Group Hospital Management Committee.

ILFORD, ESSEX. KING GEORGE HOSPITAL. Ilford AND BARKING GROUP HOSPITAL MANAGEMENT COMMITTEE. There will be a vacancy for a HOUSE PHYSICIAN (post or pre-registration) at the above Hospital on 16th July, 1954. The post will be tenable for 6 months.

Applications, giving full particulars and accompanied by testimonials, should be sent to the undersigned within 7 days of the appearance of this advertisement.

H. F. HARRIS, Deputy Secretary.
King George Hospital, Ilford.

ISLEWORTH. WEST MIDDLESEX HOSPITAL. (1143 Beds.) NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. SENIOR REGISTRAR in Radiology at above Hospital. Hospital may be visited by appointment with Medical Director.

Application forms obtainable from, and returnable to, Group Secretary, South West Middlesex Hospital Management Committee, West Middlesex Hospital, Isleworth, by 29th June.

IPSWICH. BOROUGH GENERAL HOSPITAL, Heath-road. (275 Beds.) Applications are invited for the post of HOUSE SURGEON (pre-registration post) to General Surgeon vacant on 28th June, 1954. The post, which is recognised for the R.C.S. examinations, is normally of 6 months duration, and is of House Officer grade.

Applications, stating age, experience and qualifications, together with copies of recent testimonials, to Hospital Secretary.

IPSWICH. EAST SUFFOLK AND IPSWICH HOSPITAL. (360 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER (resident Anæsthetist). The post, which is normally of 1 years duration, is recognised for the D.A. and the F.F.A.R.C.S. examinations.

Applications, stating age, nationality, together with recent testimonials, to Hospital Secretary.

IPSWICH. EAST SUFFOLK AND IPSWICH HOSPITAL. (360 Beds.) Applications are invited for the post of SENIOR HOUSE SURGEON to the Fracture and Orthopædic Department. The post is graded Senior House Officer and is recognised for the F.R.C.S. examinations. The Department has 2 Consultants, about 60 Beds and a large outpatients attendance and offers a wide experience.

Applications, stating age, nationality, experience and copies of 3 recent testimonials, to the Hospital Secretary.

IPSWICH. EAST SUFFOLK AND IPSWICH HOSPITAL. (360 Beds.) Applications are invited for the post of HOUSE SURGEON to the Fracture and Orthopædic Department. Approved pre-registration post.

Applications, with copies of recent testimonials, to the Hospital Secretary.

KINGSTON HOSPITAL, Wolverton-avenue, Kingston UPON THAMES. Applications are invited from qualified medical officers for 2 Pre-registration Posts in General Surgery which become available on 1st August, 1954.

Applications, stating age, qualifications and experience, together with 2 recent testimonials, should reach the Physician-Superintendent of the Hospital by 26th June, 1954.

LEAMINGTON SPA. WARNEFORD GENERAL HOSPITAL. (207 Beds.) SOUTH WARWICKSHIRE HOSPITAL GROUP. RESIDENT HOUSE SURGEON (general surgery). Post vacant on 22nd June, 1954. Recognised for pre-registration.

Apply Hospital Secretary.

LEAMINGTON SPA. WARNEFORD GENERAL HOSPITAL. (207 Beds.) SOUTH WARWICKSHIRE HOSPITAL GROUP. Applications invited for post of CASUALTY OFFICER (Senior House Officer), Male or Female, resident or non-resident. Post vacant and suitable for one reading for higher qualification, affording contact with all Specialist Units in Hospital.

Applications, with names and addresses of 3 referees, to Hospital Secretary.

LEEDS (near). WOODLANDS (ORTHOPÆDIC) HOSPITAL, RAWDON, near LEEDS. (92 Beds.) SENIOR HOUSE SURGEON required for Orthopædic Hospital at Rawdon. The post will be adjoined to the Casualty and Orthopædic Unit at the Royal Infirmary, Bradford, and offers excellent opportunities for a person interested in orthopædic work. Salary £745 p.a.

Applications, stating age, nationality, qualifications and experience, with copy testimonials, to Secretary, Bradford Royal Infirmary.

LEEDS (near). MENSTON (MENTAL) HOSPITAL. Applications invited for vacancy JUNIOR HOSPITAL MEDICAL OFFICER. Facilities available for training all branches of psychiatry in conjunction with University of Leeds, Department of Psychiatry. Salary in accordance with terms and conditions of service hospital medical and dental staffs. Unfurnished flat available on rental.

Applications to Medical Superintendent, stating age, civil state, qualifications, experience and names and addresses of 2 referees.

LEEDS. UNITED LEEDS HOSPITALS. Applications are invited for the post of REGISTRAR in Anæsthetics. The appointment will be for 1 year in the first instance.

Applications, giving full details of previous experience, together with the names of 3 referees, should be forwarded to the Sub-Dean, School of Medicine, Leeds, 1, not later than 5th July, 1954.

LEEDS, 2. PUBLIC DISPENSARY AND HOSPITAL. LEEDS A GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the appointment of CASUALTY OFFICER (Senior House Officer) at the above Dispensary. The appointment will be for a period of 1 year. Salary in accordance with the agreed terms and conditions of service of hospital medical and dental staffs, with an appropriate deduction in respect of board, lodging, &c.

Applications, stating age, qualifications, experience, &c., together with the names of 2 referees, to be forwarded to the undersigned as soon as possible.

J. FOLKARD, Secretary to the Committee.

Administrative Offices, St. James's Hospital, Leeds, 9.

LEEDS, 7. JEWISH HERZL MOSER HOSPITAL. Locum RESIDENT MEDICAL OFFICER (Junior Hospital Medical Officer) required at the above Hospital for a period of 6 weeks commencing 3rd July, 1954. Salary £16 per week with a deduction for services provided.

Apply to the Administrative Medical Officer, Leeds A Group Hospital Management Committee, St. James's Hospital, Leeds, 9.

LEEDS REGIONAL HOSPITAL BOARD invites applications for the following REGISTRAR posts :—

Anæsthetics

Duties in the Harrogate and Ripon Group, mainly at Harrogate General Hospital (resident/non-resident).

General Surgery

St. Luke's Hospital, Bradford (150 general surgical beds) (non-resident). Recognised for the F.R.C.S.

General and Plastic Surgery

St. Luke's Hospital Bradford (150 general surgical beds). Half the duties will be in the Plastic Unit (20 Beds) (preferably resident).

Orthopædic Surgery

(*a*) Hull A Group (50 orthopædic beds), Hull B Group and East Riding Group (50 orthopædic beds) (non-resident). Includes some duties in the Casualty Department at the Hull Royal Infirmary.

(*b*) Huddersfield Royal Infirmary and other hospitals in the Huddersfield Group (34 orthopædic beds) (non-resident).

(*c*) The General Hospital, Batley (36 orthopædic beds) and other hospitals in the Dewsbury Batley and Mirfield Group (resident).

Psychiatry

Psychiatric Unit, St. James's Hospital, Leeds (resident). Offers special opportunity for experience with neurotic and psychosomatic patients.

Thoracic Surgery

Pinderfields General Hospital, Wakefield. Experience in thoracic surgery desirable. 53 Beds under the Consultants to the Teaching Hospital. (Resident.)

Applications, stating age, qualifications and details of present and previous appointments with dates, together with the names and addresses of 3 referees, should be forwarded to the Secretary, Joint Registrars Committee, Park-parade, Harrogate, not later than 1st July, 1954.

LEEDS REGIONAL HOSPITAL BOARD AREA. Medical ACT, 1950. RESIDENT HOUSE OFFICER posts. Recognised pre-registration House posts will be available for the 6 months commencing 1st August, 1954, in the following hospitals approved under the Medical Act, 1950.

City Hospital, York (178 Beds)
1 General Surgical.
1 Surgical (general surgery and gynæcology).
Both recognised for F.R.C.S.

Hull Royal Infirmary (149 Beds)
1 Medical.
1 General Surgical (recognised for F.R.C.S.).

Hull Royal Infirmary (Sutton) (102 Beds)
1 Medical.
1 General Surgical (recognised for F.R.C.S.).

Western General Hospital, Hull (543 Beds)
1 Medical.
1 Surgical (general surgery, gynæcology and radiotherapy).

Kingston General Hospital, Hull (398 Beds)
1 Medical.
1 General Surgical.

Victoria Hospital for Children, Hull (143 Beds) (all posts recognised for D.C.H.)
1 Medical.
1 Surgical (general surgery and orthopædic).

Westwood Hospital, Beverley (202 Beds)
1 General Surgical (recognised for F.R.C.S.).

East Riding Hospital, Driffield (249 Beds)
1 Medical (general medical and pædiatric).
1 Surgical (general surgery, gynæcology and E.N.T.). Recognised for F.R.C.S.

Pontefract General Infirmary (98 Beds)
1 Medical (general medical and pædiatric).
1 General Surgical.

Clayton Hospital, Wakefield (200 Beds)
1 Surgical (general surgery and gynæcology). Recognised for F.R.C.S.

General Hospital, Wakefield (158 Beds)
1 Medical (general medical and geriatrics).

Pinderfields Hospital, Wakefield (663 Beds)
1 General Surgical.
1 Surgical (orthopædic surgery).

General Hospital, Batley (99 Beds)
1 Surgical (general surgery and E.N.T.).
1 Surgical (orthopædic and ophthalmology).

Staincliffe General, Dewsbury (314 Beds)
1 Medical (general medical and dermatology).
1 Medical (general medical and pædiatric).
1 Surgical (general surgery, orthopædic and E.N.T.).

Huddersfield Royal Infirmary (304 Beds)
1 Medical (general medical and pædiatric).
1 Surgical (general surgery and orthopædic). Recognised for F.R.C.S.

Princess Royal Maternity, Huddersfield (59 Beds)
1 Midwifery (recognised by R.C.O.G.).

Royal Halifax Infirmary (301 Beds)
1 Midwifery (recognised by R.C.O.G.).

Halifax General Hospital (425 Beds)
1 Medical.
1 Medical (pædiatric).
2 General Surgical (recognised for F.R.C.S.).

Bradford Royal Infirmary (507 Beds)
1 Medical.
2 General Surgical (recognised for F.R.C.S.).

St. Luke's Hospital, Bradford (828 Beds)
2 Medical.
1 Medical (general medical and dermatology).
1 Surgical (general surgery and casualty).
1 General Surgical.
1 Surgical (general surgery and plastic).
2 Surgical (orthopædic and casualty).
All surgical posts recognised for F.R.C.S.

Keighley Victoria Hospital (144 Beds)
1 Medical (general medical, pædiatric and dermatology).
1 Surgical (general surgery, orthopædic and E.N.T.). Recognised for F.R.C.S.

General Hospital, Otley (170 Beds)
1 Surgical (general surgery and orthopædic).

Seacroft Hospital, Leeds (80 surgical beds)
1 Surgical (general surgery, E.N.T. and ophthalmology).

Harrogate General Hospital (249 Beds)
2 Medical.

Candidates should express, where applicable, their preference for medical, surgical or midwifery posts within the same hospital on the application form.

Candidates wishing to apply for posts at more than 1 hospital should complete a separate form in respect of each hospital.

Application forms can be obtained from the Senior Administrative Medical Officer, Leeds Regional Hospital Board, Park-parade, Harrogate, or from the Dean, The School of Medicine, Thoresby-place, Leeds, 2, and should be returned to either of the above-named as soon as possible. Application may be made in advance of results of final examination.

LEEDS A GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the appointment of SENIOR HOUSE OFFICER (anæsthetics) for duties mainly at St. James's Hospital. The appointment, which is recognised for the D.A. and the F.F.A. R.C.S., will be for a period of 1 year, and the salary will be in accordance with the agreed terms and conditions of service of hospital medical and dental staffs—namely, £745 p.a., with an appropriate deduction in respect of board, lodging, and other services provided.

Applications, stating age, qualifications, experience, &c., together with the names of 2 referees, to be forwarded to the undersigned as soon as possible.

J. FOLKARD, Secretary to the Committee.

Administrative Offices, St. James's Hospital, Leeds, 9.

LUTON AND DUNSTABLE HOSPITAL, Luton, Bedfordshire. Applications are invited for the post of GYNÆCOLOGICAL HOUSE SURGEON, vacant 1st July, 1954. Recognised as pre-registration post and includes some obstetrical duties. The appointment will be for 6 months in the first instance.

Applications, stating age, nationality, qualifications and experience, together with copies of 3 recent testimonials, to be sent to the Secretary by 28th June.

LUTON AND DUNSTABLE HOSPITAL, Luton, Bedfordshire. Applications are invited for the post of HOUSE SURGEON, vacant 1st July, 1954. Recognised as pre-registration post and for F.R.C.S. The appointment will be for 6 months in the first instance.

Applications, stating age, nationality, qualifications and experience, together with copies of 3 recent testimonials, to be sent to the Secretary by 28th June.

LUTON AND DUNSTABLE HOSPITAL, Luton, Bedfordshire. Applications are invited for the appointment of HOUSE SURGEON for Accident Service, including duties in the Hand Infection Unit, vacant 4th July, 1954. Recognised as pre-registration post and for F.R.C.S. The appointment will be for 6 months in the first instance.

Applications, stating age, nationality, qualifications and experience, together with copies of 3 recent testimonials, to be sent to the Secretary by 28th June.

LUTON AND DUNSTABLE HOSPITAL, Luton, Bedfordshire. Applications are invited for the post of HOUSE SURGEON, vacant 9th July, 1954. Recognised as pre-registration post and for F.R.C.S. The appointment will be for 6 months in the first instance.

Applications, stating age, nationality, qualifications and experience, together with copies of 3 recent testimonials, to be sent to the Secretary by 5th July.

LUTON AND DUNSTABLE HOSPITAL, Luton, Bedfordshire. Applications are invited for the post of ORTHOPÆDIC HOUSE SURGEON, including duties with the Accident Service vacant 1st July, 1954. Recognised as pre-registration post and for F.R.C.S. The appointment will be for 6 months in the first instance.

Applications, stating age, nationality, qualifications and experience, together with copies of 3 recent testimonials, to be sent to the Secretary immediately.

LEICESTER GENERAL HOSPITAL AND ROYAL INFIRMARY. SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time NON-RESIDENT REGISTRAR (pædiatrics) required from 1st September, 1954. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 28th June, 1954, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

LEICESTER GENERAL HOSPITAL (445 Beds) AND ROYAL INFIRMARY (507 Beds). SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time NON-RESIDENT REGISTRAR (orthopædics) required. Appointment for 1 year in first instance, Leicester General Hospital (72 orthopædic beds), Leicester Royal Infirmary (54 orthopædic beds).

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 28th June, 1954, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

LIVERPOOL, 15. SEFTON GENERAL HOSPITAL. (995 Beds, 116 Cots.) Applications are invited for the following resident appointments which will become vacant at the above-named Hospital on 1st September, 1954, and will be for a period of 6 months. These posts are approved as pre-registration posts.

5 HOUSE PHYSICIANS (general).
2 HOUSE PHYSICIANS (psychiatric).
2 HOUSE SURGEONS (general).
2 HOUSE SURGEONS (obstetric).
1 HOUSE PHYSICIAN (tropical).

The terms and conditions of service will be in accordance with the regulations of the Ministry of Health.

Application forms may be obtained from the undersigned, to whom they should be returned not later than Thursday, 8th July, 1954.

GARNET CHAPLIN, Secretary to the Committee,
South Liverpool Hospital Management Committee.

LIVERPOOL. THE UNITED LIVERPOOL HOSPITALS. ROYAL LIVERPOOL CHILDREN'S HOSPITAL. Applications are invited for posts as HOUSE SURGEON and ORTHOPÆDIC HOUSE SURGEON for the period to 31st August, 1954. The posts are open to registered practitioners and pre-registration applicants.

Apply as soon as possible on forms obtainable from the Secretary, The United Liverpool Hospitals, 80, Rodney-street, Liverpool, 1.

LIVERPOOL, 14. BROADGREEN HOSPITAL. The following posts fall vacant on 1st September, 1954, and are tenable for 6 months. All are approved for pre-registration purposes.

(*a*) ADMISSION-ROOM AND CASUALTY OFFICER (non-resident). Grading Senior House Officer or House Officer, dependent upon experience.
(*b*) 4 HOUSE PHYSICIANS.
(*c*) 3 HOUSE SURGEONS.

Salaries for posts (*b*) and (*c*) £425–£475–£525 p.a. according to experience, less £125 p.a. for residential emoluments. For post (*a*) as for (*b*) and (*c*) or if graded Senior House Officer £745 p.a.

Application forms obtainable from the undersigned at the above address, to be returned completed not later than 25th June, 1954. H. BLYTHE, Group Secretary.

LIVERPOOL AND DISTRICT EASTERN HOSPITAL MANAGEMENT COMMITTEE. Required, HOUSE SURGEONS (obstetrics and gynæcology). 2 for Mill Road Maternity Hospital, Liverpool, 6, and 2 for Broadgreen Hospital, Liverpool, 14. Posts are tenable for 6 months from 1st September, 1954, and whilst the vacancies are recognised for pre-registration purposes, preference will be given to registered practitioners. Salaries £425–£475–£525 p.a. according to experience, less £125 p.a. in respect of residential emoluments.

Application forms, obtainable from the undersigned, to be returned completed not later than 25th June, 1954.

H. BLYTHE, Group Secretary.
Broadgreen Hospital, Liverpool, 14.

MANCHESTER ROYAL EYE HOSPITAL. United MANCHESTER HOSPITALS. Applications are invited for post of SENIOR HOUSE OFFICER. Salary £670 p.a., less £130 p.a. for residential emoluments.

Application forms may be obtained from the undersigned.

H. R. NORTH, General Superintendent.

MANCHESTER REGIONAL HOSPITAL BOARD. Applications are invited for the post of REGISTRAR (resident or non-resident) in E.N.T. Surgery to the Wigan and Leigh Group of hospitals with main duties at the Royal Albert Edward Infirmary, Wigan. The post which is recognised for D.L.O. is now vacant.

Applications should be made to the Secretary, Wigan and Leigh Hospital Management Committee, Knowsley House, Wigan, together with the names of 2 referees.

MANCHESTER REGIONAL HOSPITAL BOARD.

(*a*) SENIOR REGISTRAR in Diagnostic Radiology; joint post with United Manchester Hospitals. The person appointed will be required to undertake duties at Christie Hospital and Holt Radium Institute, Manchester, and at the United Manchester Hospitals (Manchester Royal Infirmary, &c.). D.M.R.D. essential.

(*b*) SENIOR REGISTRAR in Radiotherapy, Christie Hospital and Holt Radium Institute, Manchester. D.M.R.T. essential and higher qualification desirable.

Application forms from the Senior Administrative Medical Officer to the Board, Cheetwood-road, Manchester, 8, to be returned by 28th June, 1954.

MANCHESTER REGIONAL HOSPITAL BOARD. The ROYAL INFIRMARY, BOLTON. (237 Beds.) RESIDENT REGISTRAR in General Surgery (Resident Surgical Officer). Recognised for F.R.C.S. The post is the senior resident surgical appointment and offers excellent practical experience.

Applications, stating age, nationality, qualifications, experience and the names of 2 referees, should be sent immediately to the undersigned at the Royal Infirmary, Bolton.

H. P. TRAVIS, Group Secretary,
Bolton and District Hospital Management Committee.

MANCHESTER REGIONAL HOSPITAL BOARD invite applications for the post of RESIDENT REGISTRAR in Obstetrics and Gynæcology in the West Manchester Group of hospitals with main duties at Park Hospital, Davyhulme. There are 73 obstetric beds, 31 gynæcology beds, and a special care Baby Unit of 7 Beds at Park Hospital. Post recognised for the M.R.C.O.G. Vacant 31st August, 1954. Appointment for 1 year, renewable.

Application forms from Secretary, Park Hospital, Davyhulme.

MANCHESTER REGIONAL HOSPITAL BOARD. Applications are invited for the whole-time resident post of REGISTRAR in General Surgery (recognised for F.R.C.S.(Eng.)) in the Ashton, Hyde and Glossop Group of hospitals.

Applications, stating age, nationality, qualifications and experience, together with copies of 3 testimonials, should be forwarded to the Group Secretary, Astley-road, Stalybridge, Cheshire.

MANCHESTER. UNITED MANCHESTER HOSPITALS. MANCHESTER ROYAL EYE HOSPITAL. Applications are invited for the post of REGISTRAR (resident). Tenable for 12 months, subject to renewal. Previous experience in ophthalmology essential. The terms and conditions of service for hospital medical and dental staffs will apply.

Application forms may be obtained from the undersigned.

H. R. NORTH, General Superintendent.

MANCHESTER. UNITED MANCHESTER HOSPITALS. SAINT MARY'S HOSPITALS. Applications are invited for the post of SENIOR HOUSE OFFICER in Obstetrics. Applicants must have had previous hospital experience in general medicine and surgery, and in obstetrics. The post is recognised for purposes of the M.R.C.O.G. examination. The duties involve clinical responsibility for mothers and babies, and supervision of the work of pre-registration House Officers is also included. The appointment is for 12 months from 1st September, 1954. National scale.

Application forms may be obtained from the undersigned and returned not later than 5th July, 1954.

A. R. WISE, General Superintendent.
Saint Mary's Hospitals, Whitworth Park, Manchester, 13.

MANCHESTER. WEST MANCHESTER HOSPITAL MANAGEMENT COMMITTEE.

Park Hospital, Davyhulme (General Hospital—433 Beds).

1 SENIOR HOUSE OFFICER (anæsthetics), Hospital recognised for training for Diploma in Anæsthetics. Post now vacant.

1 HOUSE OFFICER (general surgery) (Pre- or post-registration). Post recognised for training for Diploma in Anæsthetics. Post now vacant.

Eccles and Patricroft Hospital (General Hospital—64 Beds)

1 SENIOR HOUSE OFFICER. Post now vacant.

1 HOUSE OFFICER (post-registration post). Post now vacant.

The work of the Hospital is mainly surgical and there is a busy Outpatient Department.

Forms from Secretary, Park Hospital, Davyhulme.

MANCHESTER. DARBISHIRE HOUSE HEALTH CENTRE. A General Practitioner LOCUM is required for short or long periods up to 4 months commencing 14th June. Accommodation in the Centre is available, if required. 20 guineas weekly. Experience in this teaching Health Centre would be valuable for later practice.

Further particulars from the Secretary, Darbishire House Health Centre, 295, Upper Brook-street, Manchester, 13 (Telephone No. Manchester Rusholme 6322).

MAIDSTONE. WEST KENT GENERAL HOSPITAL. (141 Beds.) MID-KENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the pre-registration post of HOUSE SURGEON. 6 months appointment. Post vacant July, 1954. Salary at the rate of £425, £475 to £525 according to experience. A deduction at the rate of £125 a year is made in respect of board and lodging and other services provided.

Applications should be forwarded as soon as possible to the Administrative Officer at the Hospital.

MAIDSTONE. WEST KENT GENERAL HOSPITAL. (141 Beds.) MID-KENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of RECEIVING-ROOM OFFICER. Post now vacant. Salary £745 a year, with deduction at present of £150 a year for residential emoluments.

Applications to Administrative Officer at Hospital as soon as possible.

NEWPORT, MONMOUTHSHIRE. ROYAL GWENT HOSPITAL. (260 Beds, 10 residents. Recognised F.R.C.S.) SENIOR HOUSE OFFICER required for Casualty Department beginning of July. This is the base Hospital in the Group and all medical and surgical emergencies are admitted through casualty, which is under the full-time charge of a Senior Hospital Medical Officer, there being also 2 Senior House Officers. Post recognised for F.R.C.S. for 6 months and tenable 6 or 12 months as desired. Salary £745, less £120 for board-residence.

Write, quoting 2 referees, to T. A. JONES, Group Secretary, 64, Cardiff-road, Newport, Mon.

NEWPORT, I.W. ST. MARY'S HOSPITAL. (360 Beds.) ISLE OF WIGHT GROUP HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER required as Casualty Officer and House Officer to Consultant Obstetrician and Gynæcologist, vacant August. Salary £745, less residential charge. Modern flat available for married candidate.

Applications, with names of 2 referees, to Hospital Secretary.

NORWICH. HELLESDON HOSPITAL. Applications are invited for the post of SENIOR HOUSE OFFICER. This Mental Hospital of 1100 Beds, including a separate Neurosis Unit, serves 3 Outpatient Departments and 1 Child Guidance Clinic and maintains Occupational Therapy, E.E.G., Social Workers and Clinical Psychologist Departments. Salary £745 p.a. A flat with heating and lighting would be available for a married man at a rental of £1 per week.

Applications, with names and addresses of 2 referees, to the Medical Superintendent.

NORWICH. NORFOLK AND NORWICH HOSPITAL. Applications are invited for the following appointments vacant on 1st August, 1954. All are pre-registration posts and the salaries in each case are at the rate of £425, £475 or £525 p.a. according to experience, less £125 p.a. for residential emoluments :—

(1) **Norfolk and Norwich Hospital, Norwich**

(*a*) JUNIOR CASUALTY OFFICER (2 Casualty Officers employed in Department).

(*b*) HOUSE SURGEON (Male or Female). Post recognised for Final F.R.C.S. examination. Duties entirely general surgical.

(2) **Jenny Lind Hospital for Children, Norwich**

(*a*) RESIDENT MEDICAL OFFICER.

(*b*) HOUSE SURGEON.

At Jenny Lind Hospital which forms the entire Pædiatric Department of the United Norwich Hospitals. The duties are under the direct supervision of the Consultant staff of the Norfolk and Norwich Hospital.

(3) **West Norwich and Norwich Isolation Hospitals**

HOUSE PHYSICIAN (Male or Female). Duties include acute medical, geriatric and infectious diseases. The beds at these units are under the control of the Consultant Physicians of the Norfolk and Norwich Hospital and the successful candidate will be required to undertake general medical duties under their supervision.

(4) **West Norwich Hospital**

HOUSE SURGEON (Male or Female). Post recognised for Final F.R.C.S. examination. The beds at this Hospital are under the control of the Consultant staff of the Norfolk and Norwich Hospital.

Applications for all the above posts, stating age, qualifications and experience, with names of 2 referees, to be sent to Group Secretary, No. 6 Group Hospital Management Committee, St. Stephen's-road, Norwich.

NOTTINGHAM GENERAL HOSPITAL. Applications are invited from registered general practitioners for the post of THIRD CASUALTY OFFICER (Senior House Officer grade). Salary (less £150 emoluments) and conditions of service in accordance with those laid down by the Ministry. Duties to commence as soon as possible. This post offers wide experience of casualty work. The Staff establishment requires only 1 night in 3 emergency work, and off duty permits time for study for higher examinations.

Applications, stating age, qualifications and experience, together with copies of testimonials, to be sent to—

General Hospital, Nottingham. HENRY M. STANLEY.

NOTTINGHAM GENERAL HOSPITAL. 2 Resident HOUSE SURGEONS required (Male or Female, also open to pre-registration candidates) at the above Hospital ; duties to commence as soon as possible. Salary and conditions of service in accordance with published regulations. The appointment is for a term of 6 months.

Applications, stating age, qualifications, and experience, to be sent to HENRY M STANLEY, Group Secretary.

NOTTINGHAM GENERAL HOSPITAL. (441 Beds.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT or NON-RESIDENT CASUALTY REGISTRAR required. This busy department provides excellent experience. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 28th June, 1954, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

NOTTINGHAM GENERAL HOSPITAL. Required, SENIOR SURGICAL HOUSE OFFICER for the above Hospital, duties to commence at beginning of July, 1954. Salary (less £150 residential emoluments) and conditions of service in accordance with those laid down by the Ministry.

Applications, stating age, qualifications and experience together with copies of testimonials, to be sent to—

General Hospital, Nottingham. HENRY M. STANLEY.

NOTTINGHAM GENERAL HOSPITAL. Applications are invited from registered medical practitioners for the post of SENIOR ORTHOPÆDIC AND FRACTURE HOUSE OFFICER. (Locum Tenens considered.) The post offers exceptional experience in traumatic and orthopædic surgery. Duties to commence as soon as possible. Salary and conditions of service in accordance with Ministry regulations. If resident £150 deducted for emoluments.

Applications, stating age, qualifications and experience, together with copies of testimonials, to be sent to—

HENRY M. STANLEY, Group Secretary.

NOTTINGHAM GENERAL HOSPITAL. Applications are invited from registered medical practitioners (Male or Female—locum tenens considered) for the post of RESIDENT SENIOR ANÆSTHETIC HOUSE OFFICER ; duties to commence as soon as possible. Terms and conditions of service in accordance with published regulations of the Ministry of Health. £150 deducted for residential emoluments.

Applications, stating age, qualifications and experience, together with copies of testimonials, to be sent to—

HENRY M. STANLEY, Group Secretary.

NOTTINGHAM. CITY HOSPITAL. (804 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER (medical). Post vacant 1st August. The appointment will be for 1 year.

Applications, stating age, nationality, qualifications and experience, together with copies of not more than 3 testimonials, to be sent immediately to the Hospital Secretary, City Hospital, Hucknall-road, Nottingham.

NOTTINGHAM. CITY HOSPITAL. (804 Beds.) Applications are invited for the post of RESIDENT ANÆSTHETIST (Senior House Officer), vacant 8th July. The post is recognised for the D.A. and the F.F.A.R.C.S.

Applications, stating age, nationality and qualifications, together with copies of not more than 3 testimonials to be sent to the Hospital Secretary, City Hospital, Hucknall-road, Nottingham.

OXFORD. UNITED OXFORD HOSPITALS. Applications invited for post of RESIDENT SENIOR HOUSE PHYSICIAN to Department of Dermatology, Slade Hospital, including duties in Skin Department, Radcliffe Infirmary.

Applications, stating age, qualifications and experience, together with names of 2 referees, to Administrator, Radcliffe Infirmary, Oxford, by 25th June, 1954.

OXFORD. UNITED OXFORD HOSPITALS. Applications invited for post of RESIDENT SENIOR HOUSE OFFICER to Department of Radiotherapy, Churchill Hospital, Oxford, commencing 1st July. Experience gained in clinical use of radio-active isotopes as well as other forms of radiotherapy. Recognised as training centre for D.M.R.T.

Applications, stating age, qualifications and experience, together with names of 2 referees, to Administrator, Radcliffe Infirmary, Oxford, before 25th June, 1954.

OXFORD. * UNITED OXFORD HOSPITALS. Applications are invited for the following resident House Officer appointments vacant on 1st August, 1954, unless otherwise stated :—

Radcliffe Infirmary

*1 HOUSE SURGEON (E.N.T. Department).
†*1 PÆDIATRIC HOUSE PHYSICIAN.
1 RESIDENT JUNIOR PATHOLOGIST (Senior House Officer, vacant 1st September, 1954).
1 EMERGENCY OFFICER.

Churchill Hospital

1 SENIOR HOUSE OFFICER AND RESIDENT MEDICAL OFFICER.
1 SENIOR HOUSE PHYSICIAN.
†*1 PÆDIATRIC HOUSE PHYSICIAN.
1 RESIDENT JUNIOR PATHOLOGIST (Senior House Officer, vacant 1st September, 1954).
*1 THORACIC HOUSE SURGEON.

Cowley Road Hospital (Geriatric Unit)

1 SENIOR HOUSE OFFICER.
*1 HOUSE OFFICER.

Osler Pavilion (Tuberculosis Unit)

1 RESIDENT MEDICAL OFFICER.

T.B. Meningitis Unit

1 SENIOR HOUSE OFFICER.

* Approved as pre-registration appointment.
† Recognised by appropriate Royal College for Diploma examination.

Applications, stating age, experience and qualifications, together with names of 2 referees, to Administrator, Radcliffe Infirmary, Oxford, to arrive not later than 28th June, 1954.

RYDE, I.W. ROYAL I.W. COUNTY HOSPITAL. (116 Beds.) ISLE OF WIGHT GROUP HOSPITAL MANAGEMENT COMMITTEE. RESIDENT HOUSE PHYSICIAN, vacant mid-July. Post recognised for Pre-registration Service.

Applications, with names of 2 referees, to Hospital Secretary.

PONTYPOOL AND DISTRICT HOSPITAL, Pontypool, MONMOUTHSHIRE. (115 Beds.) JUNIOR HOSPITAL MEDICAL OFFICER (surgical) required immediately. This is the senior resident post, and resident staff consists of 2 House Surgeons, a House Physician and this post. This is a busy acute general hospital with a good Outpatient Department and regular visits from Consultants. Post affords good practical experience in surgery. Salary £775–£50–£1075, less £150 board-residence.

Write, quoting 2 referees, to T. A. JONES, Group Secretary. 64, Cardiff-road, Newport, Mon.

PONTYPRIDD (near). EAST GLAMORGAN HOSPITAL, CHURCH VILLAGE. (316 Beds and large Outpatient Department. Committee's Base Hospital serving population of 177,000.) SENIOR HOUSE OFFICER (surgical).

Applications, stating age, qualifications and experience, together with copies of 2 recent testimonials, to be sent as soon as possible to the Group Secretary, Pontypridd and Rhondda Hospital Management Committee, Courthouse-street, Pontypridd.

PONTYPRIDD (near). EAST GLAMORGAN HOSPITAL, CHURCH VILLAGE. (316 Beds and large Outpatient Department. Committee's Base Hospital serving population of 177,000.) HOUSE OFFICERS (surgical) to commence 1st August, 1954 (to include duties at the Porth and District Hospital).

Applications, stating age, qualifications and experience, together with copies of 2 recent testimonials, to be sent as soon as possible to the Group Secretary, Pontypridd and Rhondda Hospital Management Committee, Courthouse-street, Pontypridd.

PONTYPRIDD (near). EAST GLAMORGAN HOSPITAL, CHURCH VILLAGE. (316 Beds and large Outpatient Department. Committee's Base Hospital serving population of 177,000. Recognised for the F.F.A.R.C.S. and D.A.) SENIOR HOUSE OFFICER (anæsthetics).

Applications, stating age, qualifications and experience, together with copies of 2 recent testimonials, to be sent to the Group Secretary, Pontypridd and Rhondda Hospital Management Committee, Courthouse-street, Pontypridd.

PONTYPRIDD (near). EAST GLAMORGAN HOSPITAL, CHURCH VILLAGE. (316 Beds and large Outpatient Department. Committee's Base Hospital serving population of 177,000.) SENIOR HOUSE OFFICER (pathology).

Applications, stating age, qualifications and experience, together with copies of 2 recent testimonials, to be sent to the Group Secretary, Pontypridd and Rhondda Hospital Management Committee, Courthouse-street, Pontypridd.

PONTYPRIDD (near). EAST GLAMORGAN HOSPITAL, CHURCH VILLAGE. (316 Beds and large Outpatient Department. Committee's Base Hospital serving population of 177,000. Recognised for D.C.H.) HOUSE OFFICER (pædiatrics) to commence 1st August, 1954.

Applications, stating age, qualifications and experience, together with copies of 2 recent testimonials, to be sent as soon as possible to the Group Secretary, Pontypridd and Rhondda Hospital Management Committee, Courthouse-street, Pontypridd.

PONTYPRIDD (near). EAST GLAMORGAN HOSPITAL, CHURCH VILLAGE. (316 Beds and large Outpatient Department. Committee's Base Hospital serving population of 177,000. Recognised for D.Obst.R.C.O.G.) 2 HOUSE OFFICERS (obstetrics) to commence 1st August, 1954.

Applications, stating age, qualifications and experience, together with copies of 2 recent testimonials, to be sent as soon as possible to the Group Secretary, Pontypridd and Rhondda Hospital Management Committee, Courthouse-street, Pontypridd.

PONTYPRIDD (near). EAST GLAMORGAN HOSPITAL, CHURCH VILLAGE. (316 Beds and large Outpatient Department. Committee's Base Hospital serving population of 177,000. Recognised for Membership and D.Obst.R.C.O.G.) 2 SENIOR HOUSE OFFICERS (obstetrics and gynæcology).

Applications, stating age, qualifications and experience, together with copies of 2 recent testimonials, to be sent as soon as possible to the Group Secretary, Pontypridd and Rhondda Hospital Management Committee, Courthouse-street, Pontypridd.

PONTYPRIDD (near). EAST GLAMORGAN HOSPITAL, CHURCH VILLAGE. (316 Beds and large Outpatient Department. Committee's Base Hospital serving population of 177,000.) 2 HOUSE OFFICERS (medical) to commence 1st August, 1954.

Applications, stating age, qualifications and experience, together with copies of 2 recent testimonials, to be sent as soon as possible to the Group Secretary, Pontypridd and Rhondda Hospital Management Committee, Courthouse-street, Pontypridd.

PLYMOUTH. MOUNT GOLD ORTHOPÆDIC HOSPITAL (with Annexe 122 Beds). PLYMOUTH SPECIAL HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER for the Orthopædic and Fracture Service, centring on Mount Gold Orthopædic and associate hospitals. Vacancy commences from 1st August, 1954.

Applications, stating age, qualifications with dates, &c., and with copies of 2 recent testimonials, to be forwarded to the Secretary, Mount Gold Hospital, Plymouth, within 14 days of this advertisement appearing.

PLYMOUTH AND DEVONPORT. SOUTH DEVON AND EAST CORNWALL HOSPITAL.

HOUSE SURGEONS, required immediately, also 1st and 15th July, 1954, recognised for the F.R.C.S.

DENTAL HOUSE SURGEON, vacant 1st July, 1954, recognised for the Fellowship.

Applications, stating age, nationality, qualifications and experience, with names of 3 referees, to be sent to—

ARTHUR R. CASH, Group Secretary.
7, Nelson-gardens, Stoke, Plymouth.

PLYMOUTH, SOUTH DEVON AND EAST CORNWALL GENERAL HOSPITAL GROUP. AREA PATHOLOGICAL DEPARTMENT. Applications invited from duly qualified and registered medical practitioners for the appointment of RESIDENT SENIOR HOUSE OFFICER in Pathology, vacant 27th July, 1954. The appointment will be for a period of 12 months, in the new area laboratory at the South Devon and East Cornwall Hospital, Greenbank-road, Plymouth, which provides excellent modern working facilities.

Applications, stating age, nationality, qualifications and experience, together with the names and addresses of 3 referees, to be sent to ARTHUR R. CASH, Group Secretary.
7, Nelson-gardens, Stoke, Plymouth.

PLYMOUTH. SOUTH DEVON AND EAST CORNWALL HOSPITAL. Applications invited from duly qualified registered medical practitioners for the appointment of SENIOR HOUSE OFFICER in Surgery, vacant about 1st August, 1954. The appointment will be for a period of 12 months. The Hospital is recognised for the F.R.C.S.

Applications, stating age, nationality, qualifications and experience, together with the names and addresses of 3 referees, to be sent to the undersigned, closing date 10th July, 1954.

ARTHUR R. CASH, Group Secretary.
7, Nelson-gardens, Stoke, Plymouth.

PETERBOROUGH MEMORIAL HOSPITAL. East ANGLIAN REGIONAL HOSPITAL BOARD. SURGICAL REGISTRAR at above Hospital. The successful candidate will be required to undertake duties in Casualty Department. Post offers wide experience. Appointment for 1 year, renewal for second year.

Detailed applications, including age and names of 3 referees, to Secretary of Board, 117, Chesterton-road, Cambridge, by 5th July, 1954. Candidates invited to visit Hospital by direct arrangement with Hospital Management Committee Secretary at the Hospital.

PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the following appointments :—

SENIOR HOUSE OFFICER required in the Traumatic and Orthopædic Department (105 Beds). Duties mainly at the Royal Portsmouth Hospital. Vacant now.

Saint Mary's Hospital (74 acute medical beds)
HOUSE PHYSICIAN, vacant 25th July, 1954. Pre-registration post.

Royal Portsmouth Hospital (65 acute medical beds)
HOUSE PHYSICIAN, vacant 20th July, 1954. Pre-registration post.

Applications, stating age, experience, and qualifications, and names of 2 referees, should be submitted as soon as possible to—
35, Grove-road South, Southsea. E. H. HURST.

READING. ROYAL BERKSHIRE HOSPITAL. (403 Beds.) Applications are invited from provisionally registered medical practitioners (Male or Female) for the resident post of JUNIOR HOUSE SURGEON (E.N.T.) vacant 1st August, 1954. Salary £425–£475 less £125 board-residence.

Write, stating age, qualifications with dates, nationality, with copy of 1 recent testimonial, to the Secretary.

READING. ROYAL BERKSHIRE HOSPITAL. (403 Beds.) Applications are invited from registered medical practitioners (Male or Female), for the appointment of RESIDENT ANÆSTHETIST (Senior House Officer grade) vacant immediately for period of 12 months. Recognised for F.F.A.R.C.S. Salary £745 p.a., less £125 p.a. board-residence.

Write, stating age, qualifications with dates, nationality and present post, with copy of 1 recent testimonial, to Secretary.

ROCHDALE INFIRMARY. Rochdale and District HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (orthopædics). Post recognised for 6 months for F.R.C.S. examination.

Apply at once to the Group Secretary, Central Offices, Birch Hill Hospital, Rochdale, Lancs.

ROCHFORD, ESSEX. GENERAL HOSPITAL. (603 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER to the Geriatric and Psychiatric Units at the above Hospital. A wide range of facilities are available at the Hospital for the investigation, treatment and rehabilitation of acute and chronic cases.

Applications, stating age, &c., to be sent to the undersigned by 30th June, 1954. J. C. FIELD, Secretary.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. (722 Beds.) ORTHOPÆDIC HOUSE SURGEON (resident) required in the Orthopædic and Accident Unit, vacant from 1st July, 1954. The service consists of 100 Beds divided equally between traumatic surgery and "cold" orthopædics. Post is recognised for pre-registration purposes and for F.R.C.S.

Applications to be sent to Group Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. (722 Beds.) SENIOR HOUSE OFFICER required in Neurosurgical Department. Post now vacant. Suitable for candidates seeking higher qualification as it offers excellent experience in neurology.

Apply to Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford, Essex, as soon as possible.

ROMFORD, ESSEX. RUSH GREEN HOSPITAL. (301 Beds.) SENIOR HOUSE OFFICER in Anæsthetics required from 15th July, 1954. Resident post for Male or Female. Good experience, modern equipment. Recognised for D.A. and F.F.A.R.C.S.

Applications to Medical Superintendent. Hospital may be seen by arrangement. Tel. : Romford 7711.

ROMFORD, ESSEX. VICTORIA HOSPITAL. (99 Beds.) RESIDENT HOUSE SURGEON (Male) required from 14th June, 1954. Post not approved for pre-registration purposes.

Applications should be forwarded to the Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford.

ROMFORD, ESSEX. VICTORIA HOSPITAL. (99 Beds.) RESIDENT HOUSE PHYSICIAN (Male) required from 1st July, 1954. Post not approved for pre-registration purposes.

Applications should be forwarded to the Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford.

SALISBURY GENERAL HOSPITAL. Salisbury Group HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of RESIDENT HOUSE PHYSICIAN for a period of 6 months from 19th August, 1954. The post is open to pre-registration candidates.

Apply, naming 2 referees, to Group Secretary, Odstock Hospital, Salisbury.

SALISBURY GENERAL HOSPITAL. Salisbury Group HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of RESIDENT HOUSE SURGEON for a period of 6 months from 6th August, 1954. The post is open to pre-registration candidates.

Apply, naming 2 referees, to Group Secretary, Odstock Hospital, Salisbury.

SALISBURY GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of RESIDENT MEDICAL OFFICER/PÆDIATRIC REGISTRAR at Odstock Hospital for a period of 12 months in the first instance from 17th October, 1954.

Further details and application forms may be obtained from, and must be returned to, the Group Secretary, Odstock Hospital, Salisbury, within 14 days of the appearance of this advertisement.

SCOTLAND. NORTHERN REGIONAL HOSPITAL BOARD. Applications are invited for a whole-time post of MEDICAL REGISTRAR at the Inverness Hospitals. Main duties are at Raigmore Hospital, Inverness.

A form of application and a note of further particulars are obtainable from the undersigned, to whom applications should be submitted by 10th July, 1954.

A. M. FRASER, M.D.,
Secretary and Administrative Medical Officer.
Office of the Northern Regional Hospital Board,
Raigmore, Inverness.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for SENIOR HOUSE OFFICERS (Male or Female) to fill 2 posts vacant now in the Psychiatric Unit at Stobhill Hospital, Glasgow. The appointments are resident and will be for 1 year in the first instance. The Unit consists of 180 Beds with 1200 admissions yearly and deals with acute treatable cases; it is recognised for the D.P.M.

Applications, stating age, qualifications, experience and present appointment and naming 3 referees, to be lodged immediately with the Secretary, Board of Management for Glasgow Northern Hospitals, 13, Woodside-place, Glasgow, C.3.

SLOUGH, BUCKINGHAMSHIRE. UPTON HOSPITAL. Locum SENIOR HOUSE OFFICER (medical) required from 4th to 18th July.

Applications, stating age, qualifications and experience, with names of 2 referees, to Hospital Secretary.

SLOUGH, BUCKINGHAMSHIRE. UPTON HOSPITAL. HOUSE OFFICER (casualty) required (1 of 2) for busy Casualty Department. Experience provided in orthopædic and plastic cases.

Applications, stating age and qualifications, together with names of 2 referees, to Hospital Secretary.

SLOUGH, BUCKINGHAMSHIRE. UPTON HOSPITAL. Locum SENIOR SURGICAL REGISTRAR required 19th July–9th August. Person engaged may be required to do emergency work at other hospitals in the Group; possession of car an advantage.

Applications, together with copies of 3 testimonials, to Hospital Secretary.

SHEFFIELD. CITY GENERAL HOSPITAL. (Recognised for the F.F.A.R.C.S.) Applications are invited from suitably qualified practitioners (Male or Female) for the resident appointment of SENIOR HOUSE OFFICER in Anæsthetics. The post offers a wide experience in anæsthesia for general surgery, obstetrics and gynæcology and in the Departments of Urology and Thoracic Surgery.

Applications, giving full details of age, nationality, qualifications, present and previous appointments with dates, and names of 2 persons to whom reference may be made, should be forwarded to the undersigned at Nether Edge Hospital, Sheffield, 11.

W. STANSFIELD, Secretary.

SHEFFIELD, 6. MIDDLEWOOD HOSPITAL. (2000 Beds.) SHEFFIELD NO. 2 HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from Male or Female officers for the appointment of JUNIOR HOSPITAL MEDICAL OFFICER or SENIOR HOUSE OFFICER at Middlewood Mental Hospital. Living quarters and residential services are available for single officers, and a flat will shortly become available for married officers. Remuneration will be in accordance with the terms and conditions of service issued by the Ministry of Health. There are good facilities for postgraduate study for the D.P.M. and there is full collaboration with the general hospital situate in the same grounds. Excellent laboratory and other special departments. Extensive Psychiatric Outpatient Service.

Applications, stating age, qualifications and experience, together with names and addresses of 2 referees, should be forwarded immediately to the Medical Superintendent, Middlewood Hospital, Sheffield, 6.

R. EMERSON, Deputy Group Secretary.

SHEFFIELD REGIONAL HOSPITAL BOARD. Locum RESIDENT REGISTRAR (psychiatry) required immediately at the Pastures Hospital, Mickleover, near Derby. 1 month in first instance. Remuneration at rate of £16 per week, with a deduction for residence.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, naming 3 referees.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT SENIOR SURGICAL REGISTRAR for the Derbyshire Royal Infirmary (131 general surgical beds). Possession of a higher surgical qualification desirable. Appointment for 1 year in the first instance, reviewable annually. It has been agreed between the Sheffield Regional Hospital Board and the Board of Governors of the United Sheffield Hospitals that, if circumstances permit, the tenure of the appointment will be divided between the Derbyshire Royal Infirmary and the Teaching Hospitals.

Applications, giving age, nationality, qualifications, present and previous appointments with dates, together with the names and addresses of 3 referees, should be sent to the Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, to arrive not later than 28th June, 1954.

SHEFFIELD. THE UNITED SHEFFIELD HOSPITALS. Applications invited from registered medical practitioners for the following posts:—

(*a*) REGISTRAR in Anæsthetics. The successful candidate may be required to work in any of the Units of The United Sheffield Hospitals.

(*b*) RESIDENT HOUSE PHYSICIAN to the Professorial Unit at the Children's Hospital. Post vacant 1st August.

Applications, stating age, qualifications and experience, with the names of 3 referees or, in the case of post (*b*) 3 copy testimonials, should be sent within 7 days of the appearance of the advertisement to: for post (*a*) The Chief Administrative Officer, The United Sheffield Hospitals, West-street, Sheffield, 1; for post (*b*) The Superintendent, Children's Hospital, Western Bank, Sheffield, 10.

SHOTLEY BRIDGE GENERAL HOSPITAL, Shotley BRIDGE, CO. DURHAM. (557 Beds.) NORTH WEST DURHAM HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the resident posts of 2 HOUSE PHYSICIANS which are recognised for pre-registration purposes. Salary £350–£450 p.a. (at present under revision), according to experience. Deduction of £100 p.a. for board, lodging, &c. 6 months appointment.

Applications, stating age, qualifications, experience and enclosing copies of 2 recent testimonials, to the Secretary Superintendent.

SHOTLEY BRIDGE GENERAL HOSPITAL, Shotley BRIDGE, CONSETT, CO. DURHAM. NORTH WEST DURHAM HOSPITAL MANAGEMENT COMMITTEE. RESIDENT HOUSE OFFICER (obstetrics and gynæcology) required for 6 months commencing 1st August for duties in Obstetrical (30 Beds) and Gynæcological (43 Beds) Departments. Resident at Richard Murray Maternity Hospital. Recognised for D.Obst.R.C.O.G. Second pre-registration or post-registration appointment.

Apply to the Group Secretary stating age and experience and enclosing copies of 3 recent testimonials.

SOUTH SOMERSET CLINICAL AREA. The Board of GOVERNORS OF THE UNITED BRISTOL HOSPITALS AND THE SOUTH-WESTERN REGIONAL HOSPITAL BOARD. Applications are invited by the above Boards from registered medical practitioners for the joint appointment of REGISTRAR in General Surgery. The appointment will be held for 1 year in the first instance, and be renewable for a further year. During the first year, the successful candidate will work mainly at the Taunton and Somerset Hospital, Taunton, but may be required to undertake duties in other hospitals in the Area as circumstances require.

Applications, stating date of birth, qualifications and experience, together with the names and addresses of 2 referees, should be sent to the Secretary of the Regional Hospital Board, 27, Tyndalls Park-road, Bristol, 8, not later than 3rd July, 1954.

SOUTHALL, MIDDLESEX. ST. BERNARD'S HOS-PITAL (Mental). (2421 Beds.) NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. SENIOR REGISTRAR in Psychiatry at above Hospital. Hospital undertakes all modern psychiatric therapies—physical and psychotherapeutic, and has several outpatient clinics.

Application forms obtainable from and returnable to Physician-Superintendent within 10 days of the appearance of this advertisement.

SOUTHAMPTON GENERAL HOSPITAL. (471 Beds— 80 surgical.) 2 HOUSE SURGEONS required middle and end of July, 1954. Posts tenable for 6 months. Both recognised for F.R.C.S. and Pre-registration Service.

Applications, with copies of testimonials, should be forwarded as soon as possible to the Group Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHAMPTON GENERAL HOSPITAL. (471 Beds.) HOUSE PHYSICIAN (resident) required towards end of July. Post tenable for 6 months; pre-registration candidates eligible.

Applications, with copies of testimonials, should be forwarded as soon as possible to the Group Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHAMPTON. ROYAL SOUTH HANTS HOSPITAL. (278 Beds.) CASUALTY OFFICER/SENIOR HOUSE OFFICER (orthopædic) required for the above Hospital (Orthopædic Unit 74 Beds). This Hospital is the centre to which all trauma from a large industrial town and port is directed thus providing excellent experience in the treatment of traumatic conditions.

Applications, with copies of testimonials, to be submitted as soon as possible, to the Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHAMPTON. ROYAL SOUTH HANTS HOSPITAL. (278 Beds.) SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the post of Whole-time REGISTRAR in Anæsthetics at the above Hospital. Candidates may visit the Hospital if they so desire.

Forms of application, obtainable from the undersigned, should be returned not later than 3rd July, 1954.

FRANK JENNINGS, Secretary,
Southampton Group Hospital Management Committee.
Bullar-street, Southampton.

SOUTHAMPTON. ROYAL SOUTH HANTS HOSPITAL (278 Beds) AND SOUTHAMPTON GENERAL HOSPITAL (471 Beds). SENIOR HOUSE OFFICER (E.N.T.) required immediately. This post is recognised for the F.R.C.S. (Eng.) and D.L.O. examinations and provides experience in all branches of E.N.T. work, including audiometry. The Group includes a diagnostic and distributing hearing-aid centre.

Applications, with copies of recent testimonials, should be forwarded as soon as possible, to the Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

STAFFORD. STAFFORDSHIRE GENERAL INFIRMARY. (175 Beds.) HOUSE PHYSICIAN (Male or Female). Post or pre-registration candidate considered. Post vacant 1st July.

Applications, giving full particulars and copies of 3 recent testimonials, to the Group Secretary, Stafford Hospital Management Committee, 13, Foregate-street, Stafford.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. (475 Beds.) GYNÆCOLOGY DEPARTMENT. STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER or HOUSE OFFICER according to experience. Post recognised for M.R.C.O.G. and/or for pre-registration (surgery). Experience in abnormal obstetrics available, but the work is mostly gynæcological.

Applications, with details and 2 testimonials, to the Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. HOUSE OFFICER (medical) required. Post vacant 1st July, 1954. Recognised for pre-registration experience.

Applications, with copy testimonials, to the Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent, as soon as possible.

STROUD GENERAL HOSPITAL, Stroud, Gloucestershire. 2 SENIOR HOUSE OFFICERS required. 1 for medicine and 1 for surgery.

Applications, naming 2 referees, to the Hospital Secretary, Stroud General Hospital, Stroud, Glos.

SWANSEA HOSPITAL. (403 Beds.) Glantawe Hospital MANAGEMENT COMMITTEE. Registered medical practitioners are invited to apply for the resident appointment of SENIOR HOUSE OFFICER in the Gynæcological Department of the above Hospital.

Applications, stating age, qualifications and experience, should be addressed to the Group Secretary, Glantawe Hospital Management Committee, St. Helen's-road, Swansea.

SWANSEA HOSPITAL. (403 Beds.) Glantawe Hospital MANAGEMENT COMMITTEE. Registered medical practitioners are invited to apply for the resident post of SENIOR HOUSE OFFICER in the E.N.T. Department of the above Hospital. The Hospital is recognised under the regulations of the F.R.C.S. (E.N.T.) and the D.L.O.

Applications, stating age, qualifications and experience, should be forwarded to the Group Secretary, Glantawe Hospital Management Committee, St. Helen's-road, Swansea.

SWANSEA. MOUNT PLEASANT HOSPITAL. Glantawe HOSPITAL MANAGEMENT COMMITTEE. Registered medical practitioners are invited to apply for the appointment of JUNIOR HOSPITAL MEDICAL OFFICER for work in the Medical and Surgical Departments, and in the chronic sick wards of the above Hospital.

Applications, stating age, experience and qualifications, should be addressed to the Group Secretary, Glantawe Hospital Management Committee, St. Helen's-road, Swansea.

TAPLOW, near MAIDENHEAD. CANADIAN RED CROSS MEMORIAL HOSPITAL. HOUSE SURGEON required for post vacant 5th August. Preference given to persons seeking pre-registration post under Medical Act, 1950.

Applications, stating age, qualifications with dates, together with copies of 2 testimonials, to Hospital Secretary.

TAUNTON HOSPITAL MANAGEMENT COMMITTEE. TAUNTON AND SOMERSET HOSPITAL. Applications are invited for the post of HOUSE SURGEON (general surgery). This is a pre-registration post and is recognised for F.R.C.S.

Applications, stating age, qualifications with dates, nationality, and details of experience, together with 2 recent testimonials, should be sent immediately to the Secretary, Musgrove Park Hospital, Taunton, Somerset.

TAUNTON HOSPITAL MANAGEMENT COMMITTEE. TAUNTON AND SOMERSET HOSPITAL. Applications are invited for the post of PÆDIATRIC HOUSE PHYSICIAN. This is a pre-registration post and is recognised for the Diploma in Child Health and includes supervision of newborn infants.

Applications, stating age, qualifications with dates, nationality and details of experience, together with 2 recent testimonials, should be sent immediately to the Secretary, Musgrove Park Hospital, Taunton, Somerset.

TREDEGAR GENERAL HOSPITAL. (20 miles from Newport and 24 from Teaching Hospital in Cardiff; 6 miles from the Vale of Usk, Surgical Unit of 50 Beds, with also 6 orthopædic beds, under daily supervision of Consultant Surgeon and visiting supervision of Orthopædic Surgeon. Busy Outpatient and Casualty Departments.)

1 SENIOR HOUSE OFFICER (surgery).

1 HOUSE SURGEON (pre-registration if suitable candidate available).

Senior House Officer post tenable 12 months: salary £745, less agreed deduction for full residential emoluments. House Officer post tenable 6 months: salary £425–£525, less agreed deduction for married quarters and emoluments of £125 p.a. for single residential emoluments.

Apply, with full particulars, to the Group Secretary, Hospital Management Committee, St. Martin's-road, Caerphilly, near Cardiff.

WARE PARK HOSPITAL, Ware, Hertfordshire. (129 Beds—Pulmonary Tuberculosis.) Temporary JUNIOR HOSPITAL MEDICAL OFFICER (pulmonary tuberculosis) required immediately. Resident.

Applications to Secretary, Hertford Group Hospital Management Committee, Hertford County Hospital, Hertford (Tel. Hertford 2275).

WALSALL HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the following appointments, vacant 1st August:—

Manor Hospital (333 Beds)
HOUSE SURGEON (1 vacancy).
HOUSE PHYSICIAN (2 vacancies).
General Hospital (181 Beds)
HOUSE SURGEON (2 vacancies).
HOUSE PHYSICIAN (1 vacancy).

All above posts recognised pre-registration.

Applications to Secretary, with names of 2 referees.

WARRINGTON GENERAL HOSPITAL. (368 Beds.) Applications are invited for the post of HOUSE SURGEON (Male or Female), recognised for pre-registration, at the above Hospital. National Health Service terms and conditions. The staffing of the Surgical Unit consists of a Senior Registrar, Registrar and 2 House Surgeons. The post offers a comprehensive training in surgery.

Apply, giving full particulars, to—

H. L. BOOT, Group Secretary,
Warrington and District Hospital Management Committee.
c/o General Hospital, Warrington, Lancs.

WARRINGTON INFIRMARY. (172 Beds.) Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER (Resident Casualty Officer). The commencing salary is in accordance with the scale £700–£50–£1000, less a deduction of £130 for residential emoluments. Applications will also be considered for a short-term period on a week-to-week basis.

Applications, stating age, experience and qualifications, should be forwarded or telephoned to—

H. L. BOOT, Group Secretary,
Warrington and District Hospital Management Committee.
c/o General Hospital (Tel. No. 1666), Warrington, Lancs.

WARRINGTON INFIRMARY. Warrington and District HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from qualified practitioners for the vacancy of RESIDENT ANÆSTHETIST (Senior House Officer grade), Male or Female, at the Warrington Infirmary. Scale of salary £670 p.a., less £130 p.a. for residential emoluments.

Applications to—

H. L. BOOT, Group Secretary,
Warrington and District Hospital Management Committee.
c/o General Hospital, Warrington.

WARWICK HOSPITAL. (264 Beds.) South Warwickshire HOSPITAL GROUP. Applications are invited for the resident appointment of HOUSE SURGEON (House Officer), pre-registration, vacant end of July. Good experience in general surgery available. Candidates taking final examination may apply.

Applications, with 2 testimonials, to be forwarded to the Medical Superintendent, Warwick Hospital, Lakin-road, Warwick.

WARWICK HOSPITAL. (264 Beds.) South Warwickshire HOSPITAL GROUP. HOUSE PHYSICIAN (resident) required. Post vacant end of July. Pre-registration or registered candidates may apply.

Applications, together with 2 testimonials, to be forwarded to the Medical Superintendent, Warwick Hospital, Lakin-road, Warwick.

WEST BROMWICH AND DISTRICT GENERAL HOSPITAL, Edward-street, WEST BROMWICH. (144 Beds.) WEST BROMWICH AND DISTRICT HOSPITALS MANAGEMENT COMMITTEE GROUP NO. 18. Applications are invited for the post of HOUSE SURGEON, vacant immediately. Salary, terms and conditions in accordance with the Ministry of Health regulations. The post is tenable for 6 months, resident, and is recognised for Pre-registration Scheme.

Applications, together with 3 recent testimonials, should be submitted to J. O. ROBINS, Esq., Group Secretary.

WESTON-SUPER-MARE GENERAL HOSPITAL. (110 Beds.) Applications are invited from registered medical practitioners for the resident appointment of HOUSE SURGEON (non pre-registration). The appointment will be for a period of 6 months in the first instance and may be renewed for a further 6 months.

Applications, stating age, qualifications and experience, together with names and addresses of 2 referees, should be addressed to the Secretary, Weston-super-Mare Hospital Management Committee.

WOLVERHAMPTON GROUP.

The Royal Hospital, Wolverhampton (an Associated Hospital of the University of Birmingham Medical School)
SENIOR HOUSE OFFICER or HOUSE OFFICER (Fracture and Orthopædic Department), vacant now.
SENIOR HOUSE OFFICER (Anæsthetist), vacant now.
HOUSE OFFICER (Casualty Department), vacant now.
*2 HOUSE OFFICERS (general medicine), 1 vacant 21st June, 1 vacant 30th June.
*3 HOUSE OFFICERS (general surgery), 2 vacant 30th June, 1 vacant 19th June.
*HOUSE OFFICER (pædiatrics). Appointment recognised for D.C.H. Vacant 16th July.

New Cross Hospital, Wolverhampton
*HOUSE OFFICER (general surgery), vacant now.
SENIOR HOUSE OFFICER (obstetrics). Appointment recognised for M.R.C.O.G. Vacant 5th July.
*Approved for Pre-registration Service.

Applications, with copies of 3 recent testimonials, to be sent to Group Secretary,
The Royal Hospital, Wolverhampton.

WHITEHAVEN HOSPITAL, Cumberland. (109 Beds, plus 19 beds in Annexe.) SENIOR HOUSE SURGEON, with orthopædic and casualty duties, vacant immediately.

Detailed applications, stating qualifications with dates and copies of 2 testimonials, to Group Secretary, Workington Infirmary, Cumberland.

WIGAN. ROYAL ALBERT EDWARD INFIRMARY. (200 Beds.) CASUALTY OFFICER (pre-registration post), vacant 1st July, 1954. Recognised for F.R.C.S. examinations.

Applications, together with names of 2 referees, to Secretary, Royal Infirmary, Wigan.

WIGAN. ROYAL ALBERT EDWARD INFIRMARY. (200 Beds.) HOUSE SURGEON (Male or Female) required at the above Hospital. Recognised for the F.R.C.S. Approved pre-registration post.

Applications, stating age, qualifications, &c., together with the names of 2 referees, to the Secretary, Royal Albert Edward Infirmary, Wigan.

WINDSOR. KING EDWARD VII HOSPITAL. House SURGEON in General Surgery required (Male or Female), for post vacant 13th August. Recognised for F.R.C.S. Preference given to persons seeking pre-registration House Officer post under the Medical Act, 1950. Applicants required to be members of a Medical Protection Society.

Applications, stating age, nationality, qualifications with dates and experience with copies of 3 testimonials, to Hospital Secretary by 11th July.

WINDSOR. KING EDWARD VII HOSPITAL. House SURGEON in General Surgery required, Male or Female, for post vacant 24th July. Recognised for F.R.C.S. Preference given to persons seeking pre-registration House Officer post under the Medical Act, 1950. Applicants required to be members of a Medical Protection Society.

Applications, stating age, nationality, qualifications with dates, and experience with copies of 3 testimonials, to Hospital Secretary by 27th June.

WORCESTER ROYAL INFIRMARY. Applications invited for the post of HOUSE SURGEON for general surgical work (pre-registration or otherwise).

Applications to the Secretary.

WORKINGTON INFIRMARY. (108 Beds.) Resident HOUSE SURGEON (Male or Female), pre-registration. Good experience in general and paediatric surgery and casualty work. First, second, or Senior House Officer appointment according to experience, at appropriate remuneration. Vacant now.

Applications, naming 2 referees, to the Secretary, Workington Infirmary, Cumberland.

WORTHING GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of Whole-time REGISTRAR in Chest Diseases. Duties at Worthing, Southlands and Horsham Hospitals (3 General Hospitals) and Swandean Hospital, Worthing (tuberculosis). New post. Previous chest experience necessary. Car essential.

Forms of application are available from the undersigned.

A. V. OAKTON, Group Secretary.

129, Brighton-road, Worthing, Sussex.

YORK A AND TADCASTER HOSPITAL MANAGEMENT COMMITTEE.

York County Hospital (Acute Hospital of 269 Beds with full Consultant staff); **York City Hospital** (Modern General Hospital of 265 Beds with full Consultant staff)

1 CASUALTY OFFICER (with charge of orthopædic beds) required immediately for each hospital, resident or non-resident. Junior Hospital Medical Officer grade. Salary £775–£50–£1075, less £153 if resident. Both posts recognised for F.R.C.S.

York. Fairfield Sanatorium (63 Beds); **City Hospital** (265 Beds)

Required immediately, SENIOR HOUSE OFFICER in Chest Diseases and General Medicine (non-resident) to spend half time at Fairfield Sanatorium (63 Beds) and City Hospital (8 beds reserved for investigation of chest cases), the remainder of time at County and City Hospitals (269 and 265 Beds respectively), in Department of General Medicine. Previous experience in treatment of tuberculosis an advantage. Salary £745.

York Maternity Hospital (50 Beds)

RESIDENT JUNIOR OBSTETRIC HOUSE SURGEON required immediately. Post recognised for D.Obst.R.C.O.G. Salary £475 or £525, less £125 for residence.

York Military Hospital (Civilian Wing) (60 Beds)

Required immediately, SENIOR HOUSE OFFICER (resident or non-resident). There are 18 gynæcological beds, 30 general surgical beds, and 12 medical beds. The Hospital is associated with the County Hospital (general hospital of 269 Beds) where relief casualty and emergency work and relief work for House Surgeons may be undertaken and where residence can be provided. Salary £745, less £153 if resident.

Applications, giving age, nationality, experience, qualifications, and names of 2 referees, immediately to the Secretary, York A and Tadcaster Hospital Management Committee, Bootham Park, York.

NEW YORK. ALBANY HOSPITAL, Albany, New York, U.S.A. NEUROLOGY RESIDENCIES available in 700-Bed University-Teaching, General Hospital. Salary range $1620–$2220 annually, plus laundry, uniforms and room.

Address inquiries to Medical Director.

NEW YORK. NEW ROCHELLE HOSPITAL, New ROCHELLE, NEW YORK, U.S.A. (360-Bed general community hospital.) Approved by the Joint Commission on Accreditation of Hospitals. Also approved by American College of Surgeons and American Medical Association for Internship and Residency Training. Only graduates from approved university schools accepted. Term of Internship: 1st July, 1954–30th June, 1955. INTERNES—$150 per month plus full maintenance. Return passage to England paid by Hospital after completion of internship.

Apply Superintendent.

DUBLIN. NATIONAL B.C.G. COMMITTEE, St. Ultan's HOSPITAL, 37, Charlemont-street. Applications are invited for post of VACCINATOR to the above Committee. Applicants must be medical practitioners registered in Ireland, under 40 years of age, and must have had special experience in tuberculosis work as Assistant Tuberculosis Officer and as Assistant Resident Medical Officer in a sanatorium or chest hospital. Salary £975 and travelling expenses.

Application forms obtainable from Medical Director at above address. Completed application forms must be received on or before Saturday, 3rd July, 1954.

CHANNEL ISLANDS, JERSEY. GENERAL HOSPITAL. Applications are invited for the post of MEDICAL OFFICER which will be vacant on 1st August, 1954, in the above Hospital. The appointment is for 6 months but is renewable for a further 6 months. Salary £575 p.a., less £125 for residential emoluments.

Applications to be submitted not later than 26th June, 1954, to the President, Public Health Committee, General Hospital, Jersey, C.I.

UNITED STATES. MOUNT AUBURN HOSPITAL, CAMBRIDGE, MASSACHUSETTS. Applications are invited for anesthesiology approved 2-year RESIDENCY beginning 1st September, 1954, 1st April, 1955, and 1st July, 1955. This is a 250-Bed community hospital. Teaching programme included. Salary $1800 first year and $3000 second year and full maintenance. Travel expense to and from the United States will be paid.

Apply: Director of Anesthesiology, P.O. Box 115, Cambridge, 38, Massachusetts.

Public Appointments

ANGLESEY. COUNTY OF ANGLESEY. Applications are invited from medical practitioners holding the D.P.H. or similar qualification for the appointment of ASSISTANT COUNTY AND SCHOOL MEDICAL OFFICER AND MEDICAL OFFICER OF HEALTH for the Borough of Beaumaris, the Urban Districts of Llangefni and Menai Bridge and the Rural District of Aethwy. Salary in accordance with the national award for a mixed appointment—£1368 15s., rising to £1687 10s. Starting-point according to experience. The national conditions of service, travelling allowances, &c., apply.

Application forms to be returned to the undersigned by 10th July, 1954, may be obtained from the County Medical Officer, Shire Hall, Llangefni.

WILLIAM JONES, Clerk of the County Council.

Shire Hall, Llangefni.

AUSTRALIA. VICTORIAN GOVERNMENT RAILWAYS. OPHTHALMOLOGIST required. Preferably under 45 years of age.

Further particulars from the Agent-General for Victoria, Victoria House, Melbourne-place, Strand, London, W.C.2.

BAHRAIN, PERSIAN GULF. GOVERNMENT OF BAHRAIN MEDICAL DEPARTMENT invites applications from British Women Doctors for the post of ASSISTANT to the Lady Medical Officer in charge of Women's medical services. Age 30–40. Minimum salary £1584, no allowances, rising by annual increments of £48. Starting salary on incremental scale according to age up to 40. Non-contributory gratuity on retirement. Private practice among Europeans only. No income-tax. Agreement for 2 years, renewable by mutual consent. Free quarters with hard furniture and car. Home leave amounts to 2½ months on full pay for every years service. Free return air passage every 2 years.

Applications should be addressed to Messrs. CHAS. KENDALL & PARTNERS LTD., 7, Albert-court, Kensington Gore, London, S.W.7.

LANCASHIRE COUNTY COUNCIL. Divisional Medical OFFICER, Health Division No. 13 (Heywood). Applicants must be medical practitioners holding the D.P.H. or the equivalent qualifications and with administrative experience. The Divisional Medical Officer will be required to act as Medical Officer of Health to the county districts within the division where they so desire. Basic salary as Divisional Medical Officer is £1300–£50–£1700. This scale will be increased if the Divisional Medical Officer is appointed Medical Officer of Health to 1 or more county districts and the salary at present appertaining is £1500–£50–£1900. Appointment is superannuable and subject to passing a medical examination.

Full particulars and application forms from the County Medical Officer, East Cliff County Offices, Preston, to be returned by 30th June, 1954.

CIVIL SERVICE COMMISSIONERS invite applications for about 85 pensionable appointments as MEDICAL OFFICERS in the Civil Service. These are expected to be in the Prison Commission, Home Office, Treasury Medical Service Board of Control (2 Medical Commissioners), Ministries of Education, Fuel and Power, Health (including 9 Regional M.O.s and a Pharmacologist), Labour and National Service (Factory Inspectorate), Pensions and National Insurance (including 12 M.O.s for Pneumoconiosis Medical Panels and 18 M.O.s for regional and central offices) and Supply, and Welsh Board of Health (1 Regional M.O. and 1 for Public Health Administration): 6 are expected in the Department of Health for Scotland (4 for Regional M.O.s). Interviews will be in London or Edinburgh. Candidates must be fully qualified and registered medical practitioners not less than 28 on 1st August, 1954. London remuneration (including extra duty allowance, where payable) £1549 (at age 35) rising by increments to £2100. Starting remuneration according to age, from £1241 at age 28 to £1900 at age 40 or over. Somewhat lower rates outside London. Promotion prospects.

Further information, including particulars of the work and experience required in the various Departments, and an application form from Secretary, Civil Service Commission, 6, Burlington-gardens, London, W.1, quoting No. 58/54. Application forms to be returned by 30th June, 1954.

CIVIL SERVICE COMMISSIONERS invite applications for 4 permanent posts for PSYCHOLOGISTS, in the Air Ministry and Prison Commission. There is also 1 vacancy for a PRINCIPAL PSYCHOLOGIST in the Admiralty. There may be other vacancies later. One of the Psychologist posts in the Prison Commission is open to Men and Women; the other 3 Psychologist posts and the Principal Psychologist post are open to men only. Age for Principal Psychologist at least 31 on 1st June, 1954; for Psychologist at least 21 and under 31 on 1st June, 1954, with extension for Regular Forces service.

All candidates must possess one of the following qualifications:

(*a*) A first or second class honours degree of a recognised University in which psychology was taken as a main subject.

(*b*) A higher degree in psychology.

(*c*) A Bachelor of Education degree of a Scottish University or of the University of Belfast.

(*d*) A postgraduate Diploma in Psychology, following at least 2 years systematic study.

(*e*) Fellowship of the British Psychological Society.

(*f*) Associateship of the British Psychological Society (subject to certain conditions).

Candidates taking the Final examination for (*a*), (*b*), (*c*), (*d*), in summer 1954 may be considered. Exceptionally a candidate may be accepted if he has at least 3 years responsible professional experience.

London remuneration (including extra duty allowance, where payable): Principal Psychologist £1366–£1550; Psychologist £486 (at age 21)–£966 (women), £1080 (men). Starting-pay up to £815 (women), £842 (men) at age 30 or over on entry. Promotion prospects.

Particulars and application forms from Secretary, Civil Service Commission, Burlington-gardens, London, W.1, quoting No. 75/54. Application forms to be returned by 8th July, 1954.

DEWSBURY. COUNTY BOROUGH OF DEWSBURY. Applications are invited for the appointment of DEPUTY MEDICAL OFFICER OF HEALTH AND DEPUTY PRINCIPAL SCHOOL MEDICAL OFFICER of the County Borough of Dewsbury. Applicants should be registered medical practitioners and possession of a Diploma in Public Health is desirable but not essential. Preference will be given to candidates approved previously by the Ministry of Education for ascertainment of educationally subnormal children. The salary will be within the scale £1100–£50–£1300 p.a., the commencing salary being fixed in accordance with qualifications and experience, plus a car allowance (at present £108 p.a.). Housing accommodation will be available if required. The appointment is permanent and superannuable and the successful candidate will be required to pass a medical examination.

Particulars of the duties and other conditions of the appointment, together with application forms, may be obtained from the Medical Officer of Health, Municipal Buildings, Halifax-road, Dewsbury, Yorkshire, to whom applications should be sent within 14 days after the appearance of this advertisement.

A. NORMAN JAMES, Town Clerk.

Town Hall, Dewsbury, 16th June, 1954.

DUBLIN. LOCAL APPOINTMENTS COMMISSION Positions vacant. SURGEONS (2), Limerick County Council Salary £1775, with permission to engage in limited private practice. The duties will be performed mainly in the Regional Hospital, Limerick. This advertisement is in substitution for a recent one.

Application forms and particulars from the Secretary, 45, Upper O'Connell-street, Dublin. Latest time for receiving completed application forms 5 P.M. on 30th June, 1954.

LONDON COUNTY COUNCIL. Applications are invited from registered medical practitioners for appointment as Whole-time ASSISTANT MEDICAL OFFICER in the Public Health Department. Salary £950–£50–£1300 commencing according to local government service. No emoluments. Duties are primarily connected with child health. Experience in maternity and child-welfare work and the School Health Service, and Diploma in Public Health an advantage.

Application forms, from the Medical Officer of Health (PH/D.I.) The County Hall, S.E.1, should be returned by 5th July (790).

NOTTINGHAM. CITY OF NOTTINGHAM. Health SERVICES. Applications are invited from Male registered medical practitioners holding a Diploma in Public Health for the appointment of SENIOR ASSISTANT MEDICAL OFFICER. The salary will be within the scale £1050–£50–£1400 a year, the commencing salary to be fixed in accordance with experience. In addition to special duties in connection with health education the successful candidate will be given wide opportunities for administrative and practical experience in all services of the Health Department. The appointment is superannuable and subject to the usual conditions.

Forms of application may be obtained from the undersigned, to whom they must be returned, together with the names of 2 referees, by not later than 25th June, 1954.

T. J. OWEN, Town Clerk.

Guildhall, Nottingham, June, 1954.

REGINA, SASKATCHEWAN
ALLAN BLAIR MEMORIAL CLINIC

SENIOR CANCER CLINIC ASSOCIATE required for above Clinic.

Salary range $693–$838 per month.

Requirements: Certification by the Royal College of Physicians and Surgeons of Canada and 5 years experience in the diagnosis and treatment of cancer.

For application forms write to:

PUBLIC SERVICE COMMISSION,
Legislative Building,
Regina, Saskatchewan,
Canada.

READING. COUNTY BOROUGH OF READING. Applications are invited from duly registered medical practitioners for the post of ASSISTANT MEDICAL OFFICER OF HEALTH AND SCHOOL MEDICAL OFFICER. The duties will be mainly in connection with the Maternity and Child Welfare Service and the School Health Service, but the person appointed will be expected also to carry out such other duties as may be allocated to him by the Medical Officer of Health. There is opportunity for experience in the clinical departments of the local hospitals. The salary scale is £950–£50–£1300 p.a.; the commencing salary to be in accordance with experience and qualifications.

Further particulars can be obtained from the Medical Officer of Health, Town Hall, Reading, to whom applications should be sent by 5th July, 1954. G. F. DARLOW, Town Clerk.

General Practice

For an Executive Council post (England and Wales) apply on form E.C.16A obtainable from the council. Mark envelope "Vacancy."

WOMBWELL, YORKSHIRE. Applications are invited for appointment to a Practice VACANCY caused by the resignation of 2 practitioners who practised in partnership. Total list 5031. Living and surgery accommodation available for purchase. Apply on Form E.C.16A, before 3rd July, 1954, to the undersigned from whom further particulars may be obtained.

C. H. STABLER, Clerk of the Council.

The West Riding Executive Council,
5, St. John's-north, Wakefield.

Hospital Services: Non-Medical Appointments

EPPING GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the full-time appointment of NON-MEDICAL BIOCHEMIST (Senior grade) at St. Margaret's Hospital, Epping, which will become vacant in September, 1954. The applicant will be required to work under the Consultant Pathologists, and perform biochemical estimations and examinations for hospitals and clinics, and medical practitioners and public health services in the area covered by the laboratory service. Whitley Council conditions of service. Salary scale £835–£40–£1035–£25–£1060–£20–£1080 p.a., less deduction, if resident, of £145 p.a.

Applications, with details of qualifications and experience, and names and addresses of 2 referees, to reach the Group Secretary, St. Margaret's Hospital, Epping, Essex, by 30th June, 1954.

Miscellaneous

To non-professional posts the notification of Vacancies Order 1952 applies.

Large chemical firm in Switzerland require the services of a British born Graduate in Medicine and/or Related Sciences, with a good knowledge of German, for the translation of German scientific and technical literature into fluent, accurate English. Considerable skill in the art of translation is required, and previous experience is desirable. This is intended to be a permanent engagement, after a trial period of several months in this country, so that applicants must be willing to take up residence in Switzerland. Commencing salary would be not less than £1000 p.a., plus cost-of-living bonus. Applications will be treated confidentially.—Please send application, together with details of experience, and qualifications to: Address, No. 940, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

By Direction of the Ministry of Health.

Linford New Sanatorium, near Ringwood.

Facing almost due south. The building, designed as a Sanatorium, is complete so far as the structure is concerned, 65 wards and rooms, observation-rooms and staff-rooms, all on 2 floors. Administrative block on 2 floors. Kitchen block. Highwood Farm with 4-bedroomed farmhouse, 2 Blocks of accommodation land. Highwood Copse.

In all about 96 acres.

With vacant possession (except for 4 acres let).

For sale by auction as a whole or in 5 lots in the summer (unless previously sold).

Solicitor, J. S. Tapsfield, Esq., B.A., Legal Advisor, South West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1.

Auctioneers: Messrs. KNIGHT, FRANK & RUTLEY, 20, Hanover-square, London, W.1 (MAYfair 3771).

First-floor surgery suite to let in high-class residential area. Rent £208. Ground-floor used as dental surgery for 50 years. Part of first-floor already let as surgery.—Apply PETER WILLOWS, 92, Queen's-road, Clifton, Bristol, 8.

Colostomy Toilet Products relieves sufferers. Patented dispensable cellophane envelopes.—Inquiries to COLOSTOMY TOILET PRODUCTS, 73, Burnfoot-avenue, London, S.W.6.

"Pregnancy Diagnosis by the Xenopus Method," 24-hour service. Send specimen of urine and £1 1s. fee. Hæmatology, Biochemistry, Flame Photometry.—WELBECK BIOLOGICAL LABORATORIES, 26, Park-crescent, Portland-place, W.1 (MUSeum 5386–7).

Applicants for posts requiring testimonials copied or duplicated should communicate with MANTON SECRETARIAL SERVICE, LTD., 98, Victoria-street, S.W.1 (Phone: VICtoria 0141), who are specialists in this kind of work.

Wanted. Recovered Mercury from 15s. lb. upwards delivered, according to quantity: or cash on collection arranged Greater London area; also Dental Amalgam, precious and non-ferrous scrap in all forms.—BELGRAVE BUYERS (L.), 5, Belgrave-gardens, London, N.W.8 (MAI 7513).

The British Journal of Medical Hypnotism. Quarterly. £1 1s. p.a.—Orders to the Publishers, 4, Victoria-terrace, Hove, Sussex.

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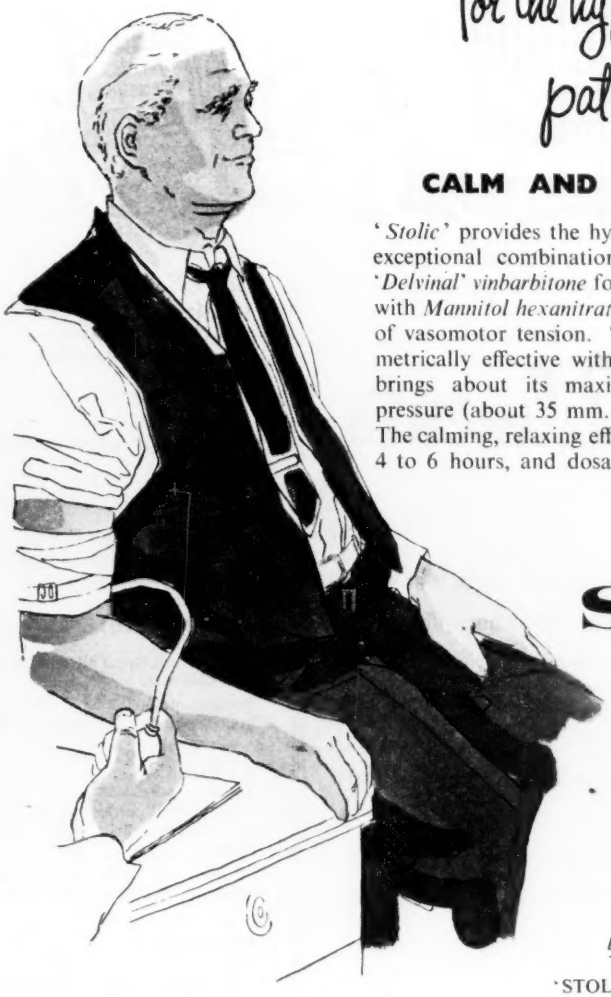

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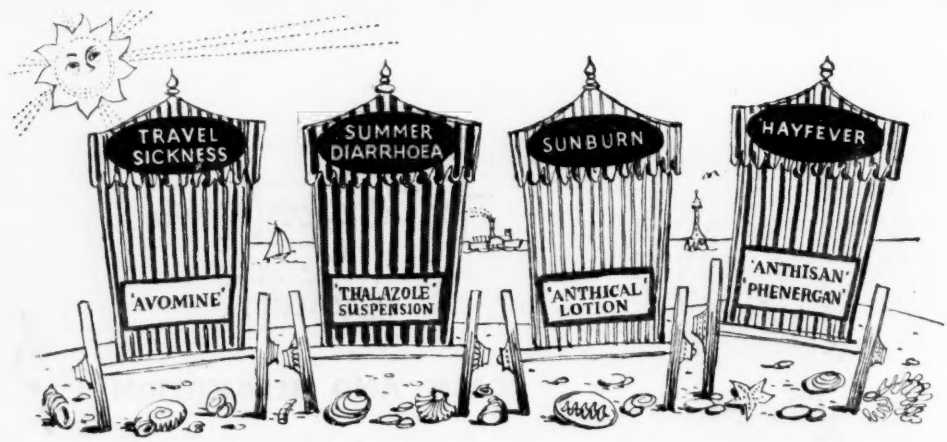

Summer Ailments

In the train of summer comes a host of minor but often annoying conditions such as hayfever and summer diarrhoea. Fortunately, most of these holiday season complaints are not serious. " I get so sick on a boat . . . he's been eating exactly the same as us, doctor . . . it was a wasp, I think". Familiar? Not the exact phrases perhaps but the type of complaint that most doctors will have heard.

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—in "summer diarrhoea" when due to dysentery bacilli.
Each 3·6 c.c. (approx. 1 teaspoonful) contains 0·75 gramme phthalylsulphathiazole.

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—in sunburn, insect bites and pruritic skin disorders.
Bottles of 4 fl. oz. mepyramine maleate—zinc oxide lotion.

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—the general-purpose antihistaminic for hayfever and allied allergic disorders.
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